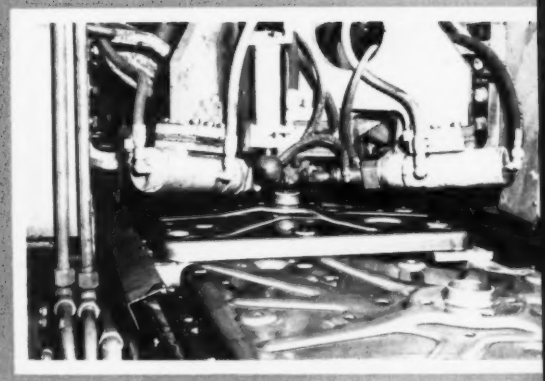
MARCH • 1958

MPM Metal Products Manufacturing

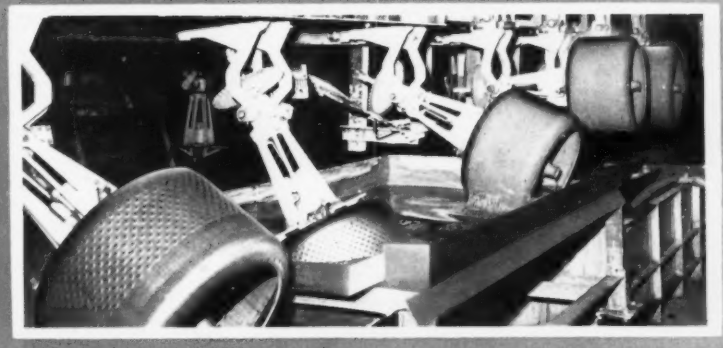
PUBLIC LIBRARY
MAR 6 1958
DETROIT

Serving the Appliance and Fabricated Metal Products Industry



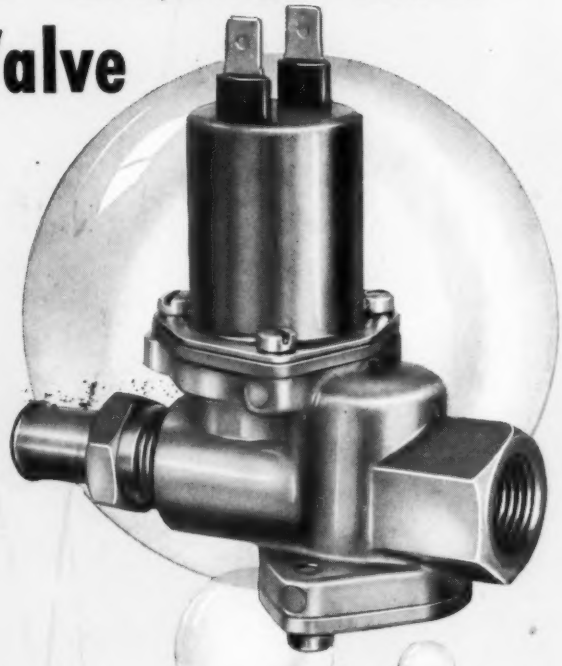
Special Equipment Boosts Production — Page 23

Housewares Show Hits All-Time High — Page 28



Tooling for Automatic Dipping at Whirlpool — Page 34

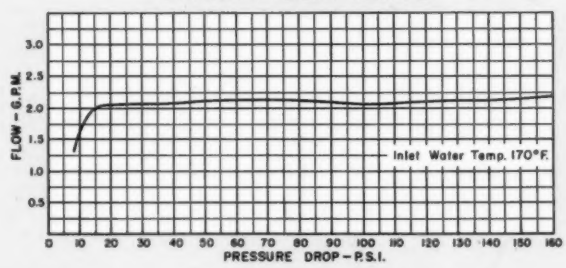
NEW DETROIT Constant Flow Water Control Valve



An improved valve design offering these important advantages for dishwashers and other equipment:

- ★ Positive opening and closing at pressures up to 200 P.S.I.
- ★ Constant predetermined flow at outlet of valve.
- ★ Standard dishwasher and washing machine flow rates. Others on application. Also supplied without flow control.
- ★ Integral inlet strainer.
- ★ Built-in water hammer protection optional.
- ★ Forged brass body – available with choice of connections.
- ★ Equally efficient for hot or cold water service.
- ★ For all standard voltages.

TYPICAL FLOW CURVE



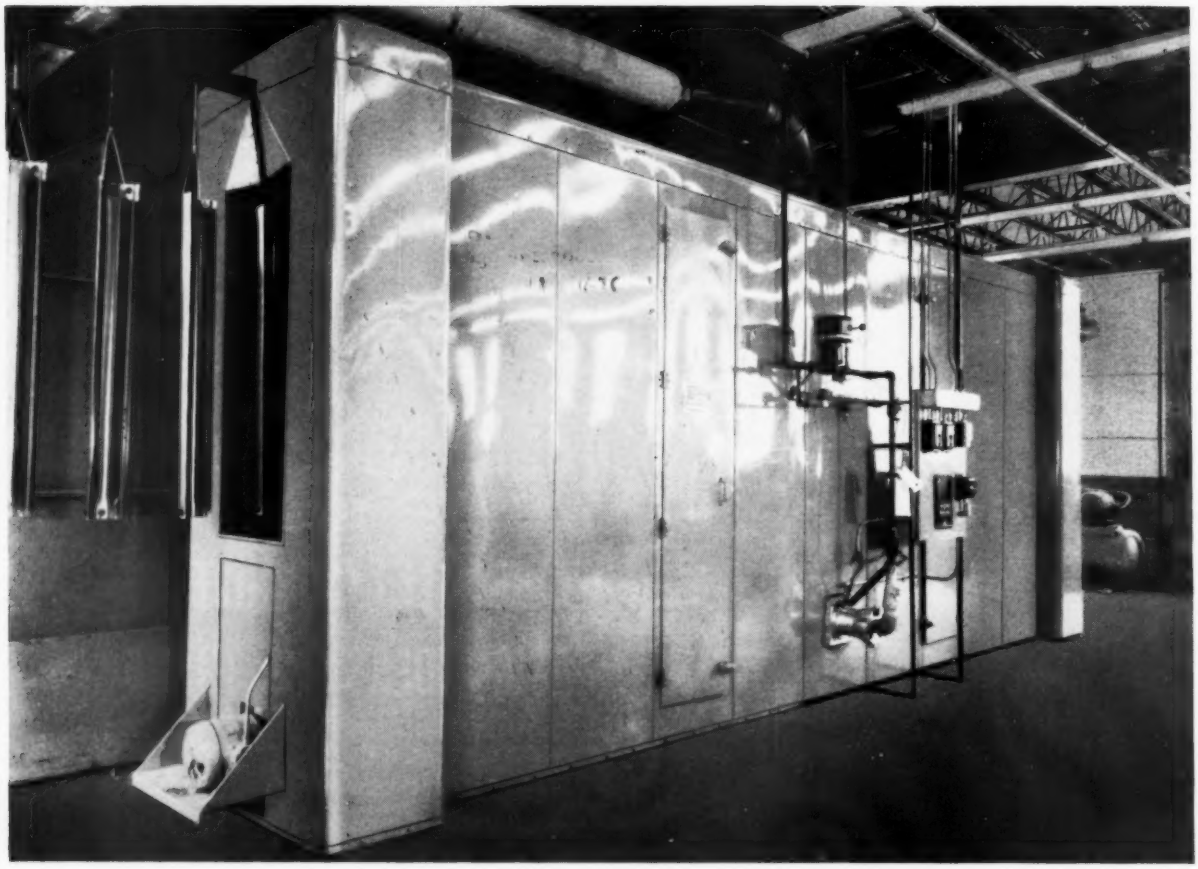
Detroit Controls Division of American-Standard, 5900 Trumbull Avenue, Detroit 8, Michigan.

AMERICAN-Standard
DETROIT CONTROLS DIVISION

Armco Enameling Iron
TABLE OF CONTENTS
PAGE
WHAT PORCELAIN ENAMEL OFFERS YOU ... 2-10
Beauty and Color ... 2
Finishes to Suit ... 3
Weatherproof ... 5
Abrasion Resistant ... 5
Resistant to Acids ... 6
Industrial Uses ... 6
Resistant to Thermal Shock ... 7
Non-Inflammable and Fire-Resistant ... 7
Highly Sanitary ... 8
Excellent Radiator of Heat ... 9
Radiation Put
Good Reflecto
Resists Radio
Thinner Coat
ARMCO EN
Analysis
Uniformity
Surface
Freedom
Workabili
Mechani
Gages
Special
DESIG
Gage
Bend
Flang
Emb
Edge Fo
Bolt and Screw Holes ... 16
Connections ... 16
Allowance for Joints ... 17
Welding ... 17
Other Joining Methods ... 17-18
Fasteners ... 18-20
FABRICATION OF ARMCO ENAMELING IRON ... 18
Drawing ... 19
Forming ... 19
Keep Sheets Clean ... 19
Use Back of Sheet for Marking ... 20
Burrs Cause Enameling Trouble ... 20-22
CLEANING AND PICKLING ... 20
21
ARMCO
ore
ly pure iron,
red that
lain enamel.
ities prevented
seldom free.
s from lot
etal variations
d as unavoidable.
neling iron sheets
nameling industry.
THIS FREE BOOKLET CAN GIVE YOU NEW DESIGN IDEAS FOR 1959
Here to help you is the complete story of porcelain enamel . . . how it can offer new opportunity in the design of your '59 line of appliances. Everything is included from analysis and application to latest methods of fabrication. There's data on the important material characteristics of Armco Enameling Iron and the superior qualities it can provide as a base metal for porcelain enamel finishes.
1
To get your free copy of this interesting and valuable booklet, clip and mail this handy coupon today. The booklet will be mailed to you promptly.
ARMCO STEEL CORPORATION, 118 Curtis Street, Middletown, Ohio
I'm interested in new design ideas. Please send me your free booklet, "Armco Enameling Iron."
Name
Title
Firm
Street
City Zone State
ARMCO STEEL CORPORATION
MIDDLETOWN, OHIO
ARMCO

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

INTEGRATION



Perhaps you'll agree that one of the most important phases of manufacturing is to blend your production facilities into a smooth-running operation.

This is specially essential in your finishing system. It takes a complete understanding of your product—and the steps to produce the quality of finish required—to successfully integrate finishing ovens, conveyors, washing machines, spray booths, etc. The end result is a profitable, quality product—with a minimum operational cost.

ALWAYS CONSIDER THESE SIX QUESTIONS

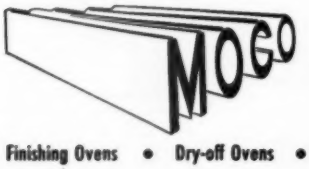
- Does the finishing system have capacity for increased production?
- Is the equipment simple enough to allow easy maintenance?
- What type of materials handling is best suited for your process and production?
- Are floor space requirements at a minimum?
- Has the system been engineered for lowest operational cost?
- Does safety equipment provide sufficient protection for your plant and personnel?

MOCO has long given careful consideration to all of these factors—and countless others. Engineering to your specific product requirements is always "the starting point."

When you are considering the purchase of a finishing system—why not consult with a qualified MOCO engineer and learn more about MOCO *Integrated* Finishing Systems.

Here's Valuable Information

This interesting bulletin on MOCO systems is yours for the asking. Why not write today?



FINISHING DIVISION

MICHIGAN OVEN COMPANY

411 BRAINARD, DETROIT 1, MICHIGAN

Finishing Ovens • Dry-off Ovens • Washing Machines • Dip Tanks • Spray Booths • Bonderizing Units • Flo-coaters • Conveyors

MARCH • 1958

VOL. 15 • NO. 3

MPM

(including finish)

MONTHLY TRADE PUBLICATION
Established January 1944
Published by
DANA CHASE PUBLICATIONS
York Street at Park Avenue, Elmhurst, Illinois
Telephones • TErrace 4-5280 • TErrace 4-5281

NBP EPA

FEATURES

Page

SPECIAL EQUIPMENT BOOSTS PRODUCTION IN FABRICATION AND ASSEMBLY OPERATIONS
How Whirlpool uses automatic equipment to speed production.. 23

BUYER REGISTRATION HITS ALL TIME HIGH AT HOUSEWARES SHOW
An MPM staff feature..... 28

DESIGN FOR A BATHROOM SCALE
An MPM product design feature..... 30

NEW ROTARY MOWER FEATURES DIE CAST CONSTRUCTION.. 32

MODERNIZED PAINT LINE HELPS BUILD BOWSER PUMPS... 35

LOW TEMPERATURE PORCELAIN ENAMELING AT INGERSOLL
An MPM staff report of the progress made in the 1300° F. process 39

THE METAL-FOAM-METAL SANDWICH
A demonstration of how an appliance cabinet can be built..... 44

WHERE IS COLOR GOING IN THE METAL PRODUCTS FIELD?
An exclusive Dictet interview with paint company executives.... 46

INFRA-RED HEATING DOES MANY JOBS IN THE METAL PRODUCTS FIELD (PART II)
by John Sincere, Technical Editor..... 51

TOOLING FOR AUTOMATIC DIPPING OF SPINNER BASKETS AT WHIRLPOOL
On the porcelain enamel finishing line..... 54

APPLES AND SOUR GRAPES
by John C. Sharp, President, Hotpoint Co..... 76

SAFE TRANSIT NEWS 86

NEWLY DESIGNED CRATE EASES PACKING AND SHIPPING 88

DEPARTMENTS

INDUSTRY MEETINGS 6
EDITORS MAIL 16
FINISH LINE EDITORIAL..... 19
NEW PRODUCTS 59
NEW INDUSTRIAL LITERATURE..... 63
INDUSTRY NEWS..... 66
COMING MPM FEATURES..... 70
INDUSTRY PERSONALS 78
SUPPLIER NEWS 79
SUPPLIER PERSONALS 86
METAL PRODUCTS STATISTICS 91
ADVERTISER'S INDEX AND CLASSIFIED..... 92

METAL PRODUCTS MANUFACTURING

FROM RAW METAL TO FINISHED PRODUCT

A **trade publication** devoted to the interests of the metal products manufacturing industry with special editorial attention to home appliances. The editorial scope covers design, engineering, market and statistical information and technical and practical information on plant facilities and all phases of manufacturing "from raw metal to finished product." Free controlled circulation to top management, purchasing, engineering and key plant management and supervision in metal product manufacturing plants. To others, subscription price is $8.00 per year, domestic. To all other countries $10.00 per year (U.S. funds). Single copies, $1.00.

Editor and publisher • DANA CHASE
Technical Editor • JOHN SINCERE
Associate Editor • WM. N. LARSEN
Western Editor • GILBERT C. CLOSE
Mgr., Customer Service • DANA CHASE, JR.
Customer Service • DOROTHEA C. MEEKER
Customer Service • R. F. KENDIG
Circulation Manager • URSULA SELLS
Advertising Production • CAROL KLEPPIN

Technical Consultants
PROF. A. I. ANDREWS
PROF. R. M. KING
PROF. L. L. CARRICK
JAMES M. LEAKE
RALPH F. BISBEE

COPYRIGHT © 1958
DANA CHASE PUBLICATIONS
PRINTED IN U.S.A.

Accepted under the act of June 5, 1934 at Aurora, Illinois authorized January 7, 1948.

When choosing aluminum coiled sheet for heat transfer products, alert manufacturers demand deep-drawing, non-earing stock for rapid as well as uniform forming of collars without cracking or buckling. Close adherence to required gauge tolerance is of prime importance in manufacturing cost.

The low-cost, highly efficient product you've made from Fairmont aluminum will give years of use to satisfied customers, because Fairmont aluminum resists corrosion and breakdown.

Along with rigid quality control, Fairmont offers "individualized" attention to manufacturers' requirements for coiled and flat sheet in 1100, 3003, 5005, 5050 and 5052 alloys. Let us show you why Fairmont aluminum is being specified by the foremost heat transfer product manufacturers. Write or call today for details.

Sales offices in Principal Cities

FAIRMONT ALUMINUM COMPANY

SUBSIDIARY OF CERRO DE PASCO CORPORATION

Dept. P-4 • FAIRMONT, WEST VIRGINIA

TITANOX* for the perfect combination

Shining beauty and durable strength are the perfect combination in titania porcelain enamels. You're more than covered on both counts when TITANOX non-pigmentary titanium dioxide is in the frit.

Along with tough, thin films—in gleaming white or smooth pastel—TITANOX-TG and TITANOX-TG-400 (for blue-white) assure economies resulting from free flow, easy handling and strict uniformity of all properties. It's obvious on the surface . . . any appliance looks better, sells better, when TITANOX is on the job. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y. Offices in principal cities.

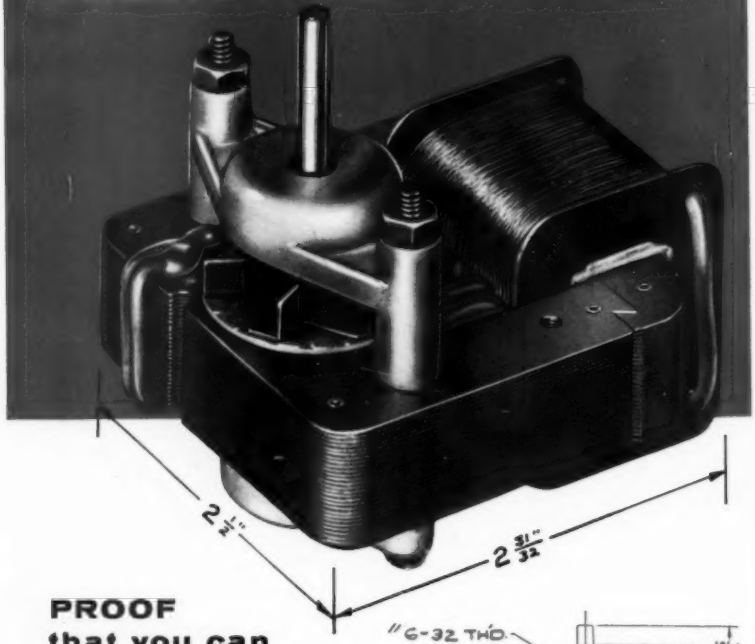
TITANIUM PIGMENT CORPORATION

Subsidiary of **NATIONAL LEAD COMPANY**

*TITANOX is a registered trade mark for the full line of titanium pigments offered by Titanium Pigment Corporation.

5211

MILLIONS now in use...



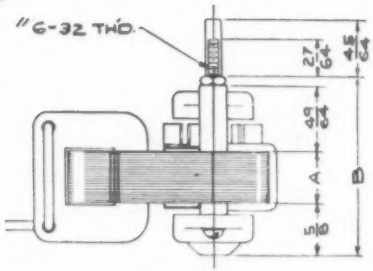
PROOF that you can

RELY on GI

Fractional H. P. Motors

1/40 H. P. to 1/1100 H. P.

Meet an all-around performance champion. GI's husky, versatile Model "A" motor. Proved dependable millions of times over, it's the power choice of the nation's great-name manufacturers . . . setting an amazing performance record in countless applications from phonographs to kitchen fans to pumps. If dependability is your aim, Model "A" is your motor!



MODEL "A" two-pole shaded pole motor available in various lamination thicknesses. Precision constructed for reliable, long hard usage. Perfectly balanced for smooth, quiet, dependable operation.

Write for quantity price quotations today!

SPECIFICATIONS

MODEL	HP 2800 RPM	Locked Torque In/Oz	Maximum Running Torque In/Oz	Rotor Free Speed RPM	Amps Free	Watts Free	A	B
A-3-CW A-3-CCW	1/500	0.70	1.1	3360	.275	10	3/8"	1 7/8"
A-5-CW A-5-CCW	1/180	1.7	2.7	3430	.460	17	5/8"	2 1/8"
A-6-CW A-6-CCW	1/130	1.9	3.3	3430	.500	19	3/4"	2 1/4"
A-7-CW A-7-CCW	1/100	2.1	3.8	3500	.530	20	7/8"	2 3/8"
A-8-CW A-8-CCW	1/90	2.5	4.5	3480	.550	23	1"	2 1/2"
A-9-CW A-9-CCW	1/70	2.7	5.3	3520	.620	27	1 1/8"	2 5/8"
A-12-CW A-12-CCW	1/60	3.0	6.5	3500	.720	28	1 1/2"	3"
A-14-CW A-14-CCW	1/50	3.1	7.0	3490	.730	33	1 3/4"	3 1/4"

Standard Shaft Diameter .1817, 1/4" diameter shaft available if required

THE GENERAL INDUSTRIES CO.

DEPT. GF • ELYRIA, OHIO

INDUSTRY MEETINGS

ELECTRICAL MANUFACTURERS

National Electrical Manufacturers' Association, Edgewater Beach Hotel, Chicago, Ill., March 10-13, 1958.

PRESSED METAL

Pressed Metal Institute's 1958 Annual Spring Technical Meeting, Sheraton-Cadillac Hotel, Detroit, Mich., March 12-14, 1958.

OFFICE FURNITURE

12th Annual Convention and Exhibit of the National Office Furniture Assn., Convention Hall, Philadelphia, Pa., March 28-31, 1958.

INDUSTRIAL ENGINEERING

Fifth Annual Industrial Engineering Conference, Purdue University, Lafayette, Ind., March 31-April 1, 1958.

GAS APPLIANCES

Gas Appliance Manufacturers' Association's Annual Meeting, The Greenbrier, White Sulphur Springs, W. Va., March 31-April 2, 1958.

TECHNICAL MEETING

American Welding Society's Annual Technical Meeting, Hotel Statler, St. Louis, Mo., April 14-18, 1958.

WELDING SOCIETY

American Welding Society's Annual Welding Show, Kiel Auditorium, St. Louis, Mo., April 15-17, 1958.

HOME LAUNDRY

American Home Laundry Manufacturers' Association's 42nd Annual Meeting, Boca Raton Hotel & Club, Boca Raton, Fla., April 20-22, 1958.

ARCHITECTURAL METAL

National Association of Architectural Metal Manufacturers' 20th Annual Convention, Shamrock-Hilton Hotel, Houston, Texas, April 27-May 2, 1958.

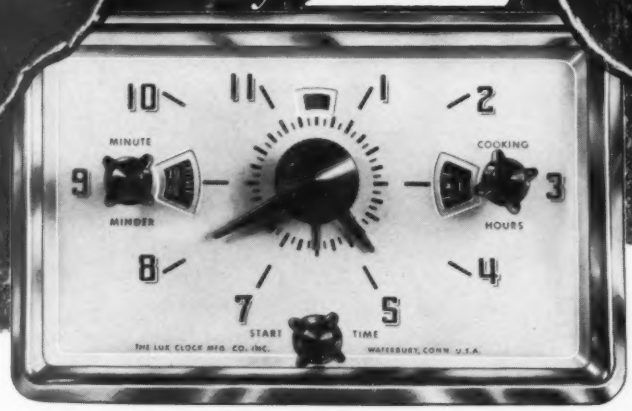
TOOL ENGINEERS

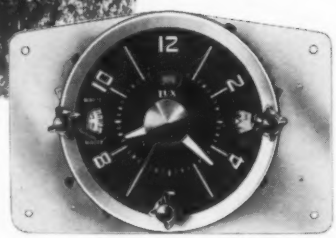
American Society of Tool Engineer's 26th Annual Meeting & Tool Show, Philadelphia Convention Center, Philadelphia, Pa., May 1-8, 1958.

AIR CONDITIONING

Air-Conditioning & Refrigeration Institute's Annual Meeting, The Homestead, Hot Springs, Va., May 4-7, 1958.

A handful of quality and style new fully automatic Range Timers by LUX





Here's a smartly styled, quality Range Timer . . . in a real handy size.

Look at these outstanding features:

- EXCLUSIVE ONE KNOB TIMING—starts oven immediately . . . shuts it off automatically.
- MINUTE MINDER TOP-SIDE CONTROL
- SYNCHRONOUS MOTOR equipped with lube-less bearings.
- 3 DIMENSIONAL STYLING
- LOW PRICE

The Precision Performance of LUX Timers can be matched only by using LUX features.

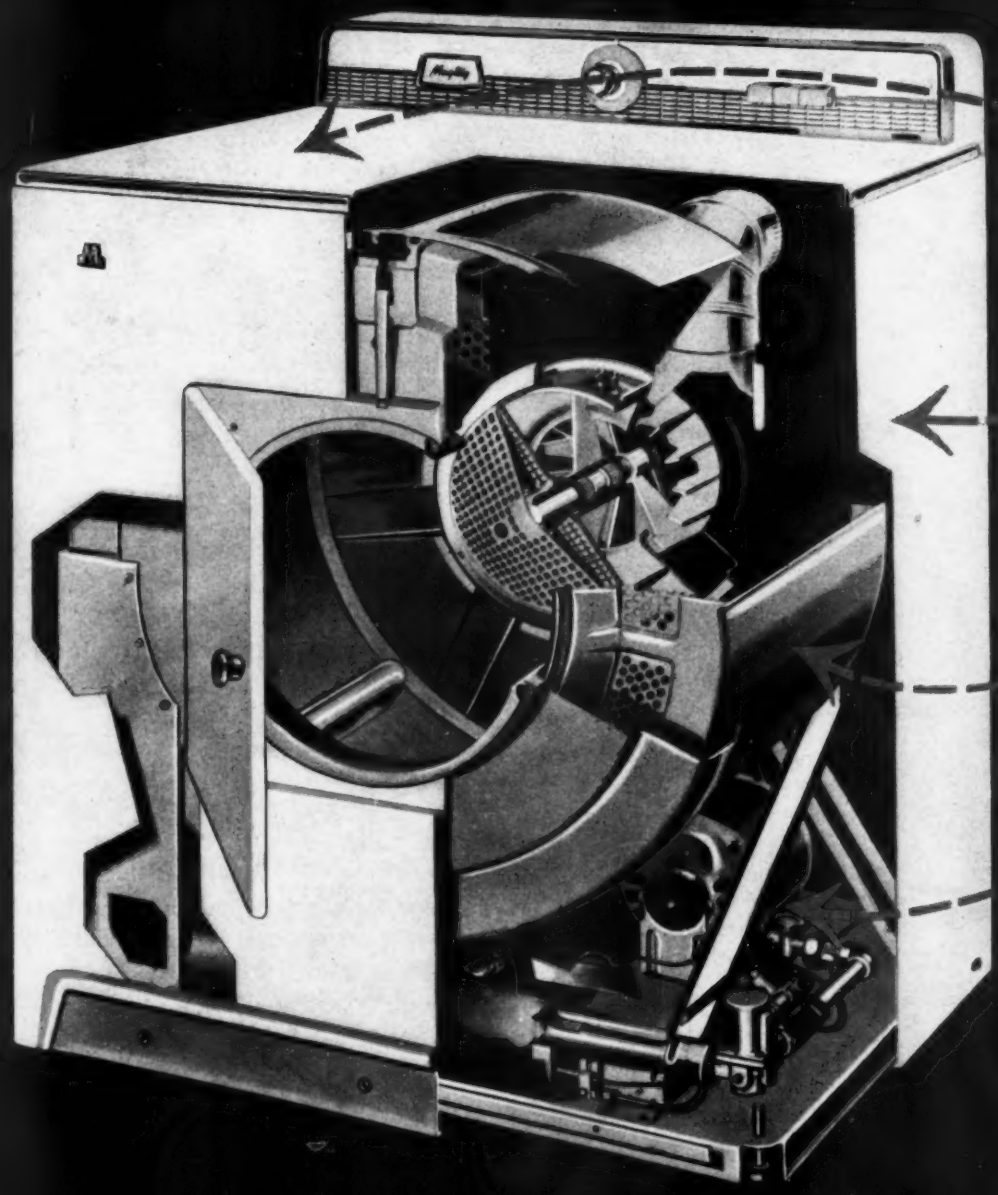
LUX . . . first . . . for lasting TIME

THE LUX CLOCK MANUFACTURING CO., INC.

LUX Time — YOUR TIME REMINDER LINE

95 JOHNSON STREET • WATERBURY 20 • CONN.

4 ways this Maytag dryer gains



ARMCO STEEL CORPORATION

MIDDLETOWN, OHIO

SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

better product performance with special Armco steels

1 TOP SURFACE—Porcelain enamel bonded to *Armco Enameling Iron* provides a durable, attractive finish that offers outstanding resistance to all ordinary household hazards. It resists heat, thermal shock, scratches, chemicals, odors and discoloration.

2 DOOR, FRONT AND SIDE PANELS—Here the emphasis is on appearance as well as utility. *Armco ZINCGRIP® Steel* (treated for painting by Maytag) is used for its excellent finish, along with rugged resistance to wear and corrosion.

3 REVOLVING DRUM—In this major part of the dryer, *Armco ZINCGRIP Steel* offers resistance to corrosion and hard wear. The ductile steel has an exceptionally tight, hot-dip coating of zinc that does not flake or peel.

4 HEATER BOX, CONE, DUCTWORK—*Armco ALUMINIZED STEEL Type 1* reflects about 80 per cent of radiant heat up to 900 F. This means that heat is channeled to the drying cylinder with minimum loss. In addition, steel parts used for heat shielding act as structural members.

These are only a few examples of the many ways Armco Special Steels can insure your product's performance . . . cut production costs . . . solve a design or manufacturing problem. To find out more about Armco Special Steels, just clip and send the handy coupon today.

ARMCO STEEL CORPORATION, 138 Curtis Street, Middletown, Ohio

I would like to know more about these Armco Special Steels.

☐ ENAMELING IRON ☐ ZINCGRIP ☐ ALUMINIZED STEEL

We manufacture _____

Name _____

Company _____

Street _____

City _____ Zone _____ State _____

Cook's is a part of **FORD'S** fabulous styling

People around the world admire the sparkle and flair of Ford styling, just as they look up to Ford engineering. Much of that colorful eye appeal comes from Cook's automotive finishes.

Cook's brings vivid beauty and lasting protection to Ford and other leading automobiles. To products in dozens of other industries, too. And Cook's dependable, uniform quality helps keep production lines running smoothly.

From Fords to fishing lures, Cook's puts the "finishing touch" on quality products you live with every day. How about your own product? Can we help you, too, finish it better?

COOK'S PAINTS

Cook Paint & Varnish Company Kansas City, Missouri

Factories: Kansas City • Detroit • Houston

MT. VERNON . . . another user of PERMA-VIEW WINDOWS

ROUND

RECTANGULAR

SQUARE

TRAPEZOID

We can manufacture any shape, any size, any thickness to meet your engineering requirements. Alternate methods of attachment may be used.

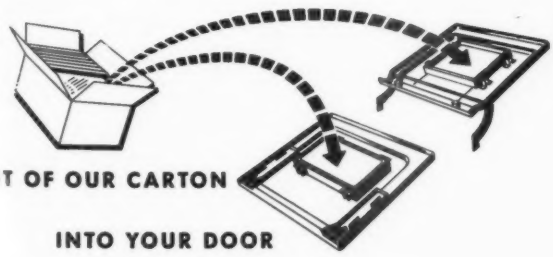
MT. VERNON FURNACE & MFG. CO.

—one of the

61 leading range manufacturers

using

PERMA-VIEW oven-door windows



OUT OF OUR CARTON

INTO YOUR DOOR

Mr. Charles H. Fredricks, Sales Manager, Mt. Vernon Furnace & Mfg. Co. has the following to say regarding PERMA-VIEW windows:

"We have been using Perma-View windows exclusively for the past 7 years. The quality and workmanship and simplicity have been of great assistance to us in the field of sales and service. Perma-View windows in Vernois Ranges have added eye appeal to every range which aids us in gaining consumer acceptance and closing sales. The simplicity of design and quality workmanship have been of great assistance in production and service. We will continue to use this fine product in our future products."

THIS IS A GENUINE PERMA-VIEW NON-FOG

MILLS PRODUCTS INCORPORATED

1015 WEST MAPLE ROAD • WALLED LAKE, MICHIGAN

TAPPING SCREWS

MACHINE SCREWS & NUTS

DRIVE SCREWS

STOVE BOLTS

IN FASTENERS SOUTHERN IS quality

CARRIAGE BOLTS

WOOD SCREWS

DOWEL SCREWS

HANGER BOLTS

If quality is an important element in your assembly operations, it will pay you to see how Southern Screw's Quality and Service has worked wonders for many industries. Southern Screws can do the same for you.

There are no better fasteners made than USA-made Southern Screws. Over a billion in stock, available from our warehouses in New York, Chicago, Dallas and Los Angeles . . . Let us quote Southern *quality* screw prices on your requirements. Compare with the cost of conventional screws. Address: Southern Screw Company, P. O. Box 1360, Statesville, North Carolina.

Southern
SCREW COMPANY
STATESVILLE • NORTH CAROLINA

Three-time ABC winner, famous bowler BILL LILLARD slams in strike after strike sending ball and pins flying against piece of TI-CO set up in pit. Close up examination by Bill shows plenty of punishment but no flaking. TI-CO's zinc coating rolled with the punch!

BOWLING CHAMP FAILS TO FLAKE INLAND TI-CO®!

Switch to **TI-CO** Non-Flaking Galvanized saves manufacturers up to 15% in Production Costs.

A well-known garage door manufacturer dispensed with plating operations—reduced costs 10%. A leading furnace manufacturer saved $20 per thousand parts produced by eliminating cleaning and painting. A company making roller gravity conveyors cut out similar operations. These are just a few of many case histories of manufacturers who realized important savings and improved their product when they started using TI-CO Galvanized Sheets.

Whenever a product requires the strength of steel, plus corrosion resistance, Inland TI-CO is the most satisfactory . . . the most practical . . . the most economical material to use. That's because TI-CO is produced with a zinc coating that will not flake even under the toughest conditions. The coating stretches with the base metal during fabrication. Deep drawing, brake or roll forming, crimping, stamping, lock-seaming even severe spin-drawing . . . TI-CO takes them all in stride with no flaking or peeling. With TI-CO there's no need for costly dipping or touching up. And the uniform, bright spangled finish adds to the over-all attractiveness of the product.

If you're manufacturing or designing a metal product that requires corrosion resistance, consider TI-CO Galvanized Sheets. Manufactured in coils or cut lengths up to 60" widths, gauges 8 to 30 inclusive. Consult your local steel distributor or Inland sales representative. Write today for a free informative booklet on TI-CO.

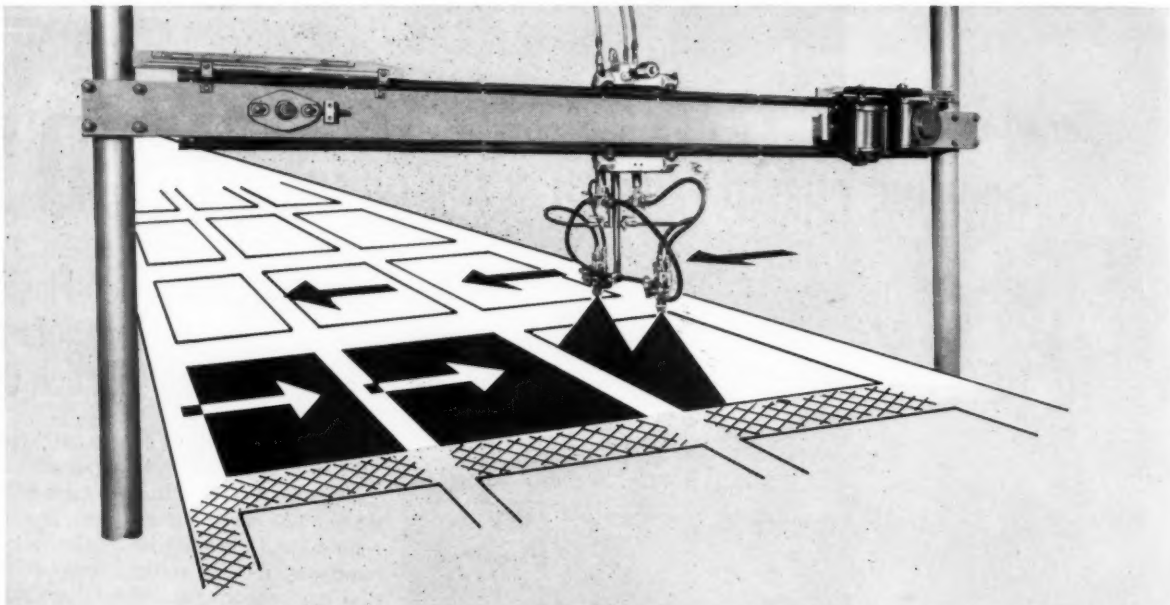
INLAND TI-CO®

INLAND STEEL COMPANY

30 W. Monroe Street • Chicago 3, Illinois

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York

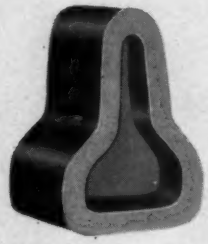
DeVilbiss Automatics...a cost-



DeVilbiss Automatic Spray Machines, in three basic types, feature speed of application and uniformity of finish not possible by any other coating method.

1. Automatic Transverse Machines coat flat or contoured shapes—from wall board to auto bodies—on horizontal or overhead conveyors.

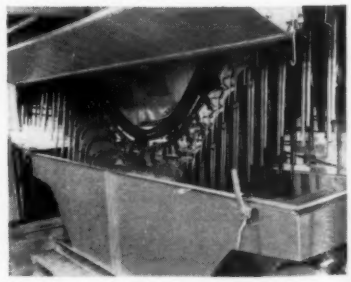
2. Automatic Rotary Machines spray all types of small shapes with ultra-fast-drying materials—from lighting fixtures to miniature railroad cars.



3. Automatic Chain-On-Edge Machines will spray all types of irregular shapes inside and out—from electric coils to glass bowls, bowling pins.

DeVilbiss Spray Guns. Complete range of models for maximum efficiency for all production requirements. *Send for Catalog IE-E.*

Newcomb-Detroit Flo-Coaters. Save manpower and floor space in prime- or single-coat applications. *Write, stating requirements.*



Newcomb-Detroit Dip-Coaters. Engineered to meet your layout and process. Paint is agitated, filtered. *Write, stating requirements.*

saving answer to coating problems

You can increase rate of production, improve quality of your work, and reduce costs to fraction of manual methods!

Complete mechanization of your coating applications with DeVilbiss Automatics helps you eliminate variation of manual operation, and boost your production—in many cases, 500% or more.

With DeVilbiss automatic spray, gun positions and angles are precisely set to coat your product quickly, uniformly, with accurate lapping, minimum overspray.

Think what this precision means to you in efficiency, speed, and over-all savings! Far greater uniformity of the spray-applied film; assured uniformity of color, luster, and texture of finish. Use of your materials is carefully established and maintained. Your rate of production remains constant. Interruptions and slowdowns due to operator fatigue are eliminated.

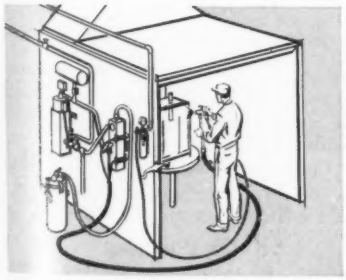
What's more, you can know in advance, without charge, the exact economies you can derive from coating with DeVilbiss Automatics. We will test-run your product and simulate your operating conditions at our fully equipped DeVilbiss Laboratory.

The results of these tests are sent to you, without obligation, for you to determine whether painting your product automatically is practical and economical.

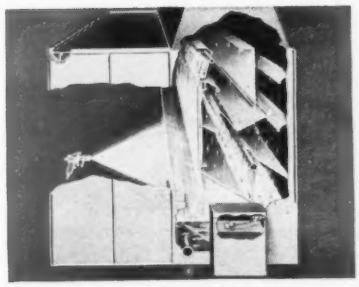
Remember: You enjoy a big advantage dealing with DeVilbiss, the only one-source designer and manufacturer of complete engineered finishing systems or individual components in the industrial-coating field. Call our nearest branch office; or write us direct for Series I-8000 Bulletins on automatic spraying.

THE DEVILBISS COMPANY, Toledo 1, Ohio • Barrie, Ontario • London, England • Branch Offices in Principal Cities

DEVILBISS DEV ND NEWCOMB-DETROIT

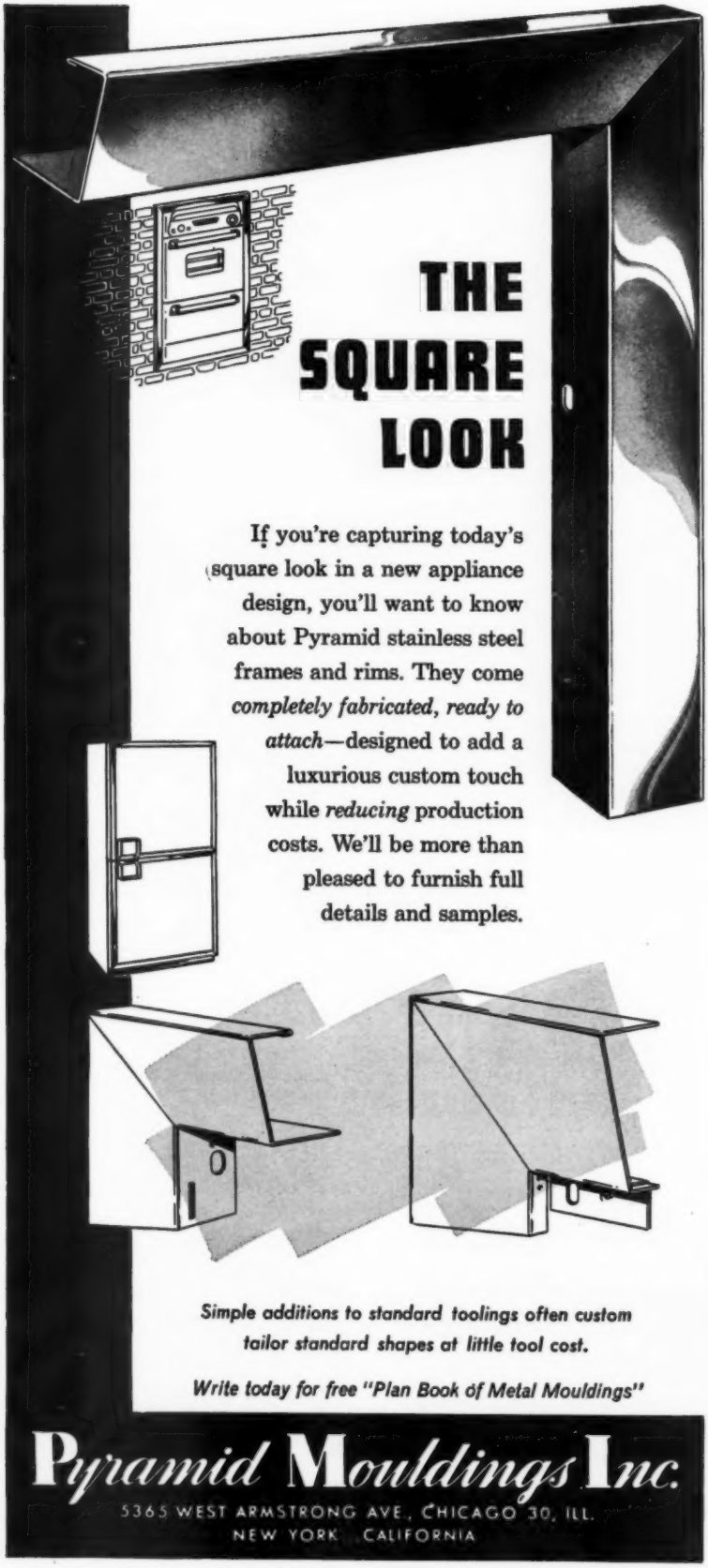


DeVilbiss Hot Spray. Provides heavier film build, with faster drying, less overspray, and fewer rejects. *Send for Bulletins IE-114B and F-286.*



DeVilbiss Spray Booths. Over 700 standard models provide efficient paint trapping for each individual job. *Send for Catalog I-7000.*

DeVilbiss Fluid Hose. Unsurpassed for resistance to solvents, oils. Flexible, kinkproof. Full line of connections. *Send for Catalog IE-E.*


THE
SQUARE
LOOK
If you're capturing today's square look in a new appliance design, you'll want to know about Pyramid stainless steel frames and rims. They come *completely fabricated, ready to attach*—designed to add a luxurious custom touch while *reducing* production costs. We'll be more than pleased to furnish full details and samples.
Simple additions to standard toolings often custom tailor standard shapes at little tool cost.
Write today for free "Plan Book of Metal Mouldings"
Pyramid Mouldings Inc.
5365 WEST ARMSTRONG AVE., CHICAGO 30, ILL.
NEW YORK CALIFORNIA

from the Editor's Mail

Interested in surface unit

Gentlemen: In the January, 1957 issue of "Finish," (now MPM) there is an article "New surface unit has selective control for all cooking temperatures," written by George Whinery, product engineer at King-Seely Corp. We were very grateful if you would forward the following questions to the company.

We are manufacturing electric ranges and are therefore very interested in the control system explained in the article. We should therefore be very pleased for an information which kind of burners should be used together with the control system, and how much the burners alone and the whole system altogether would amount to. Please mention also the time of delivery.

If you perhaps already are represented in Finland or Scandinavia, please send your answer through the agent.

Kymmene Aktiebolag
Hogfors Bruk
Karkkila, Finland

Editor's Note: As requested, these questions have been forwarded to King-Seely Corp., 3155 First St., Ann Arbor, Mich.

MPM of service

Gentlemen: It is a pleasure to inform you that your publication METAL PRODUCTS MANUFACTURING (including Finish) is a real service to us.

Would you please add to your free controlled circulation list our: Mr. R. E. Spencer, resident inspector, Porcelain Enameling Dept., Texlite, Inc., P. O. Box 7142, 3305 Manor Way, Dallas 9, Texas.

Ralph Kemp
Bryant Mfg. Co.
Tyler, Texas

Editor's Note: Mr. Spencer's name will be added promptly.

Joins ranks of MPM readers

Gentlemen: I enjoy reading the articles on manufacturing and metal products, which appear in METAL PRODUCTS MANUFACTURING.

I would appreciate your adding the name of our supply manager, Mr. R. S. Rabinovitch, to your circulation list.

R. L. Maitland
Assistant Purchasing Agent
Kelvinator of Canada, Ltd.
London, Ont., Can.

Editor's Note: Mr. Rabinovitch's name has forthwith been added to the growing list of MPM readers.

to Page 82 →

cool metal for hot planes

For jet and rocket aircraft engines, wings and surfaces that are subject to extreme conditions of heat, friction and corrosion, where the metal *must stand up* . . . design it, improve it and protect it with McLOUTH STAINLESS STEEL.

specify

McLOUTH STAINLESS STEEL

HIGH QUALITY SHEET AND STRIP

for aircraft

McLOUTH STEEL CORPORATION DETROIT, MICHIGAN

MANUFACTURERS OF STAINLESS AND CARBON STEELS

Lincoln chooses latex primer for rust-preventive bath!

In the war against rust, '58 Lincoln auto bodies get extra protection with a dip-painting in latex paint for metal.

Even salt spray can't get through to corrode metal protected with a latex finish. But Lincoln gets more than auto body protection with latex. Metal finishes made with latex eliminate fire hazard and expensive solvent recovery systems because water replaces flammable solvents. Disagreeable odors are reduced. Safer working conditions and lower insurance rates are additional benefits. And these new paints may be used without changing your present systems.

Why wait? Ask your supplier now about these new water-thinned paints formulated with Dow Latex, or write to THE DOW CHEMICAL COMPANY, Midland, Michigan, Plastics Sales Department 2149R.

LATEX T.M.

YOU CAN DEPEND ON DOW

THE finish LINE

WHERE DOES SERVICE START**.....** that is a question we hear more often as men and women all over the country continue to build up pressure and resentment against what they consider to be poor service or lack of service on automobiles, appliances, and almost every type of metal product with mechanical parts.

MPM has printed more Finish Line editorials and guest editorials on the subject of service than on any other single subject.

As Helen Kendall, former Director Appliances and Home Care, *Good Housekeeping Institute*, said recently in a letter to MPM, "I have the feeling that the service problem has been hashed over to the point of nausea — and without doing any particular good to anyone."

Nevertheless, we have been insistent that Mrs. Kendall express herself once more in a guest editorial to appear soon.

We expect to continue to keep the subject alive until some solution, or at least some improvement, appears in the service picture at the consumer level.

If you think it isn't serious, open up the subject at your next bridge session or during the next friendly get-together in the kitchen. Manufacturers who are spending millions to build acceptance for their companies and products are *losing* more millions of value in public acceptance due to improper servicing of their products.

A point to consider

There is a growing idea in the minds of many buyers and potential buyers that not all of the responsibility can be placed on the dealer or local service facilities.

The question that is building up is: are the manufacturers building quality — using quality materials and components — in their new and beautifully-designed products? Are the standards used for component specifications correctly established?

Smart buying

As one purchasing agent expressed it recently: if your part passes our standard test and you can save me ½ cent per part, you get the business. Yet, that same part which saved ½ cent in a $300 appliance may cost many, many dollars in service, loss of good will — and — in the case of a full line manufacturer — lost sales on other products in the line.

It isn't the purpose of this page to criticize a purchasing executive for buying at lowest prices — *when he is buying on established specifications.*

We do think it's time for the policy makers to take a new look and see whether or not they are always doing their company and its products a service when they try to drain the last "drop of blood" out of every motor, every piece of wiring, switch, solenoid, and other component which must give continued satisfactory service if the entire product is to operate service-free for a reasonable length of time.

We have no illusions concerning the necessity to control costs of manufacture at all levels, but we do question the final advantages, if it is true, as claimed, that standards have in some cases been lowered in order to keep selling prices under control. This question is raised for the simple reason that a penny saved in manufacturing may mean dollars spent in retail service, plus a loss of business and company reputation. This would be a costly price to pay for the initial savings made.

"JUST FINE, THANK YOU!"
...like 800,000 Americans who have been cured of cancer because they went to their doctors in time. To find out how to guard yourself against cancer, write to "Cancer" in care of your local Post Office.
AMERICAN CANCER SOCIETY

Dana Chase

EDITOR AND PUBLISHER

Announcing!

a complete special section of MPM devoted to a growing industry — manufacturing AUTOMATIC MERCHANDISING MACHINES

scheduled for May • 1958

Automatic merchandising is one of the fastest growing industries in the United States. Currently an estimated 3.5 million vending machines are dispensing more than $2 billion worth of goods and services. In saluting this growth industry, this Special Section will include:

1. An industry report by NAMA executive director, C. S. Darling.
2. A look at the future by NAMA president, William S. Fishman.
3. A design engineering feature on a new industry product.
4. Photo coverage of the latest in automatic merchandising equipment.
5. New Products section for materials and components.
6. A complete manufacturing story on operations at the plant of the world's largest manufacturer of vending machines, including fabrication, finishing, assembly, etc.

Be sure that your company is represented in the Special Section. See that editorial material and advertising reservations are handled promptly. Closing date for advertising is April 10.

Editorial contact . . . . . .
Special Projects Editor

—

Advertising contact . . . .
Manager Customer Service

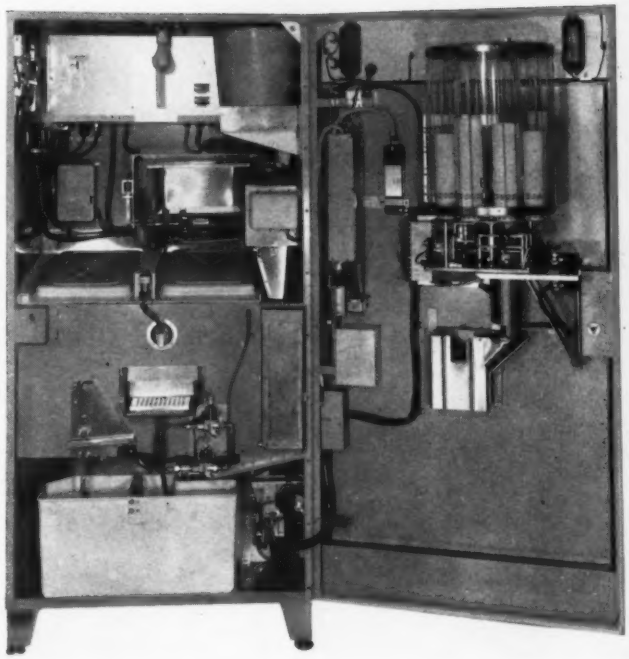
Dana Chase **PUBLICATIONS**

Elmhurst National Bank Building, York Street at Park Avenue

ELMHURST, ILLINOIS

Telephones: TErrace 4-5280 • TErrace 4-5281

NESTLE'S
COCOA
COFFEE



PHILIP MORRIS
DRINK
Coca-Cola
IN BOTTLES
Fresh
FRUIT
for
HEALTH
COLD...CRISP

WHAT'S IMPORTANT ABOUT PAINT?...

A MURRAY OHIO MFG. CO. *Zephyr* TRICYLE

This Indian Chief is about to find out, and he's going to cry like a regular baby when his war paint goes down the drain. But that will be nothing compared to his howl of outraged anguish if anything happened to the paint on his precious tricycle.

That's why the Murray Ohio Mfg. Co. uses United's KOROLITE on their wheeled toy line—to make the childhood joy of newness on the first wagon, the first fire engine last longer.

KOROLITE, or one of a vast selection of other United paints and finishes, can give your product the perfect combination of lasting beauty plus protection that you require. If you have a difficult coating problem, some of United's 160 research and development chemists are sure to create a product especially engineered to do your job better than it's ever been done before. They are experts at every phase of the finishing science from corrosion to color, from appearance to application.

So why not let UNITED send a paint expert to help you; no obligation, of course.

FIVE STRATEGICALLY LOCATED PLANTS

EAST
Benjamin Franklin Paint & Varnish Co. *Philadelphia, Pa.*

SOUTHEAST
Carolina Paint & Varnish Co. *Greensboro, N.C.*

CENTRAL
Illinois Paint Works *Chicago, Ill.*

WEST
Pacific Paint & Varnish Co. *Berkeley, Calif.*

SOUTHWEST
De Soto Paint & Varnish Co. *Garland, Texas*

UNITED

WALLPAPER, INC., 1350 SOUTH KOSTNER AVENUE, CHICAGO 23, ILLINOIS • ROCKWELL 2-5000

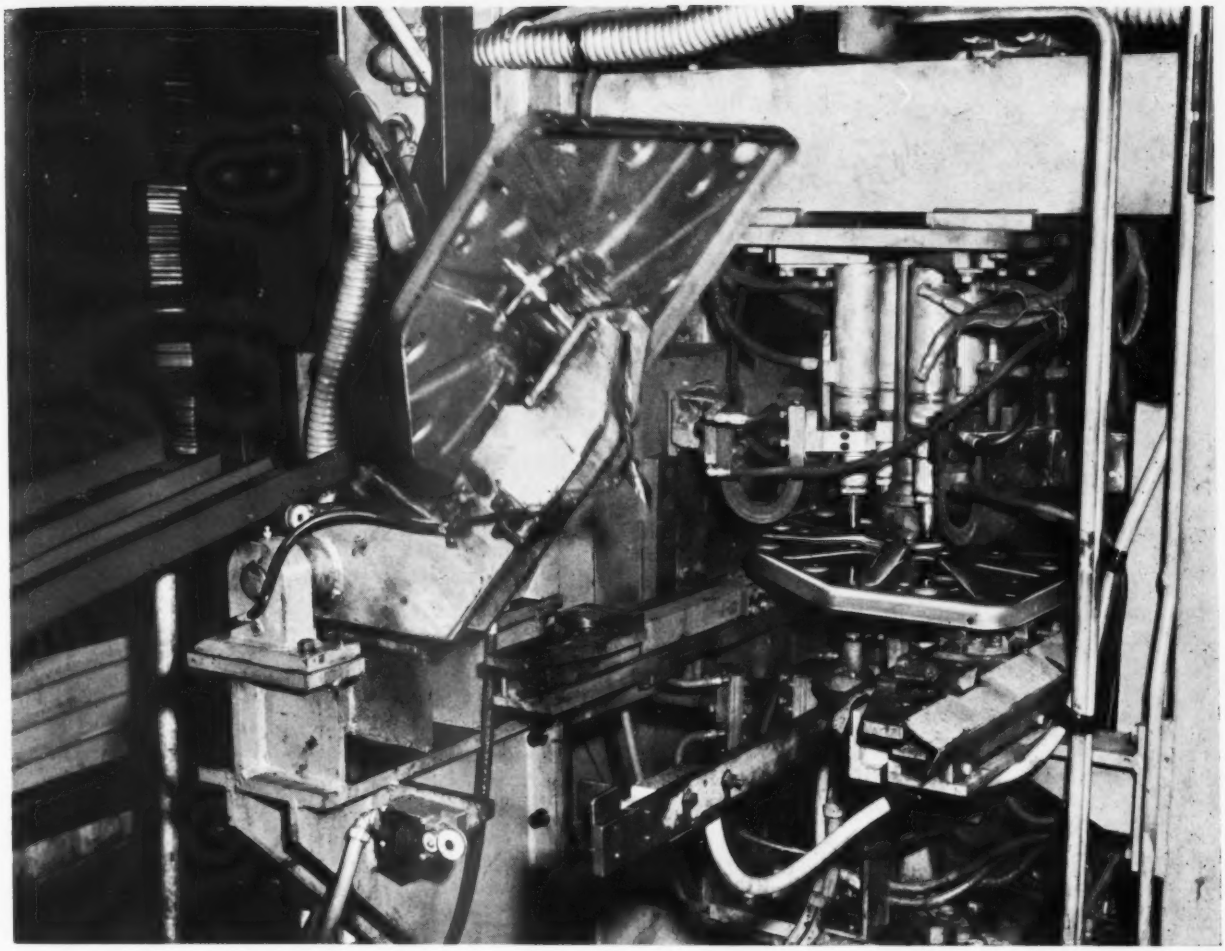


Fig. 5 — Output end of base plate welder showing one plate under four electrodes that weld plate to flange below. At left an arm, having an electromagnetic holder, is rocking a weldment from machine onto inclined tracks.

Special equipment boosts production in fabrication and assembly operations

bending, welding, weld brushing, tub testing, and assembly operations on washing machine components are handled faster on automatic equipment

MPM EXCLUSIVE FEATURE

Automatic washers for home laundry use are produced in large volume in the Whirlpool Corporation plant at Clyde, Ohio. Each such washer includes what is called a "console" or subcabinet in which the timer and other control units are installed. Two four-faced components for two consoles are formed simultaneously in a single tangent bender, shown ready for loading in Fig. 1 and after forming of two consoles in Fig. 2.

Before loading in the tangent bender, the parts to be bent are blanked from 18-gauge (0.0478"-0.0480" thick) stock. Blanking includes notching at points where bends are to be made. Subsequently, the blank is formed to channel section in a press, leaving the flanged edges of the piece notched. All holes are cam pierced.

Two stampings are laid transversely across the lower center section of the die of the tangent bender before the machine closes to make the bends, the wide face being horizontal and the flanges, containing the notches, projecting upward in vertical planes. Normally, for tangent bending, the notches extend to the bottom of the flanges; hence the flange is not bent, the bends being only in metal initially in a horizontal plane. If the bends are 90°, the notches usually have edges at or about 45°, and these

The editors of MPM wish to credit the following for their help in the preparation of this editorial feature: Edward Damschroder, Tool Engineer, and J. C. Kittle and F. F. Steinert, Welding Engineers, Clyde Division of Whirlpool Corporation, Clyde, Ohio.

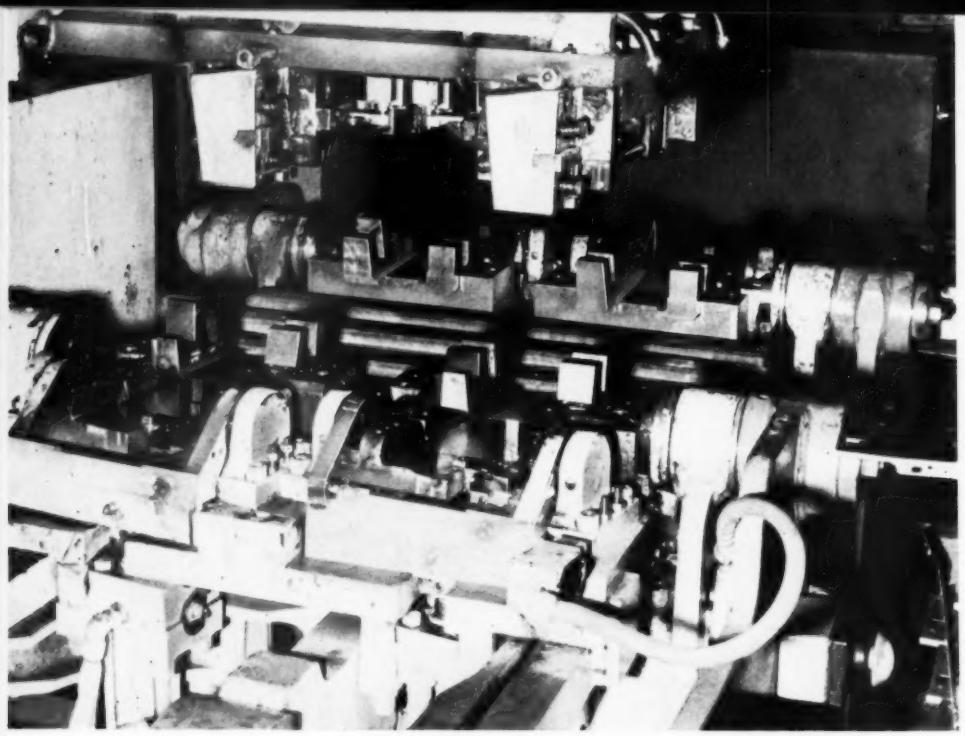


Fig. 1 — Console die in the tangent bender as it appears before loading two channel-shapes blanks from supply at right. Upper dies are in contracted and elevated position, and rocking wings of lower die are down.

edges come close together when the bend is made. Corners, in this case, remain rather weak unless subsequently reinforced.

With the channel strips here considered, however, the notches are not made to full flange depth. It follows that metal in the planes of the flanges has to be bent. This would result in buckling at the bends were they not made in slots whose width, in this case, is about 0.010″ wider than metal thickness. As the metal bend is confined by the slots, it cannot buckle, but as bending results in metal flow at the bend, thickening to fill the slot occurs, and some metal also flows inward to widen the flange at the bend.

Metal flow important

This thickening and inward flow of metal adds strength at the bend, and results in a piece that, besides being stronger, is much stiffer because the flange at the bend is continuous. This is precisely the result desired. It is necessary, however, to provide properly-made slots in the dies. These are so placed that the metal on the outside faces of the flanges is at right angles to the wider faces; hence, the flanges make flush joints against mating faces of other parts, as required.

Operation of the bender, Figs. 1 and 2, is as follows: Pre-formed and notched channel-like pieces are placed in the bending die, one at the front and one at the back. Both upper die portions are split vertically and are expanded when lowered into contact with the work pieces. This brings the four portions that provide the inner faces of slots into correct position for the bends. Lower wing sections, projections included, are then rocked up and provide the outer walls of slots as forming is done. This rocking motion results in making all bends required, including that of the metal within the slots.

300 consoles an hour

After making the bends, the wing portions of the die are rocked back, and upper portions contract and are elevated free of the formed pieces. Knockout pins are then moved up, elevating the two completely-formed pieces so that they are free for removal by hand, completing the cycle. As two pieces are formed per cycle, and the normal rate is 150 cycles an hour, output is 300 consoles an hour. Only one operator is required, not including those at the presses that perform initial blanking, forming, and piercing of the channels.

Fig. 2 — Same dies as shown in Fig. 1 after completing bending cycle. Two completely-formed consoles for automatic washing machines are shown ready for removal by hand.

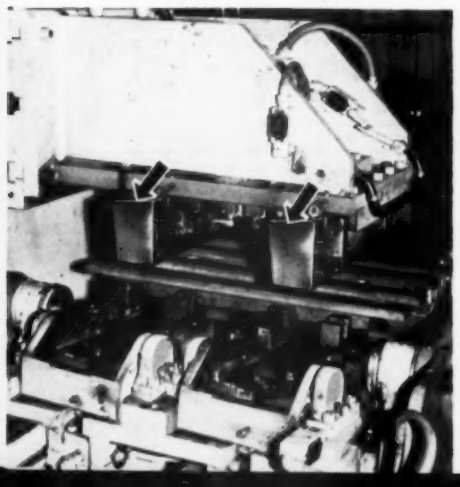


Fig 3 — Base plate of washing machine entering spot welder with a central flanged part (hidden by the plate) below and ready to be pressed in place before central collar welds are made. Loading station of welder is in foreground.

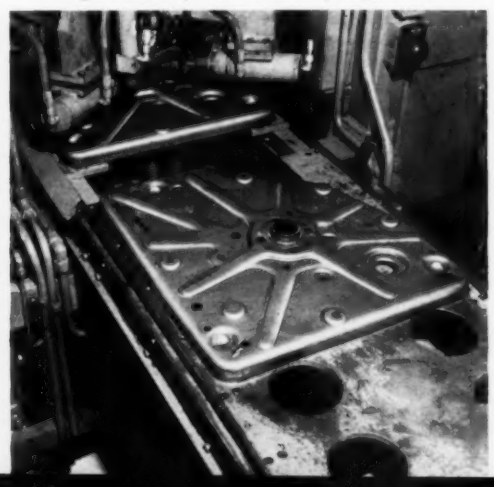
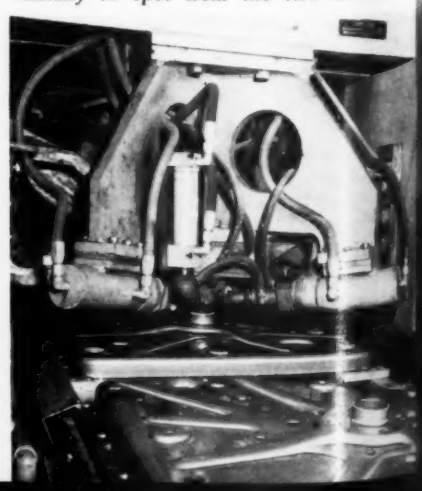


Fig. 4 — Base plate in first welding position. When head is lowered, central collar of plate is pressed over flanged hub collar. Four electrodes move in radially to spot weld the two collars.



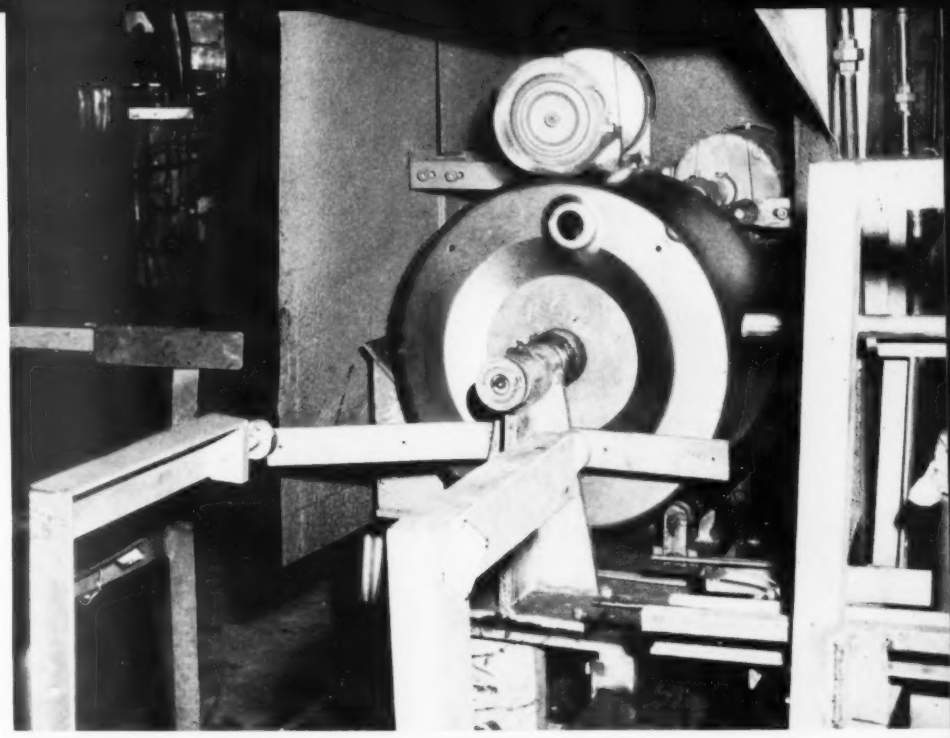


Fig. 9 — Tub in the automatic machine that wire brushes the circumferential seam weld while the tub is rotated slowly. When brushing is completed, the tub returns to the cradle and is discharged into a rack at left.

Three-stage welder replaces three machines

Several steps in automating work on other parts have been taken. One of these is the use of a three-stage welder for assembling parts for the base plate of the washing machine, replacing three separate machines that did similar work, but which required additional handling and extra operators. Fig. 3 shows the loading station of the new welder. The base plate is above, and hides from view, a flange reinforcement whose hub is to be pressed into and then welded to the central collar of the base plate after transfer under the first set of electrodes, as in Fig. 4.

At this station, the head lowers, pressing the two parts together and also lowering the four radial electrodes, which then are moved inward to make four spot welds that join the two collars. When the electrodes retract, the head is elevated, and the work piece is advanced to the next station. At this point, shown in Fig. 5, four vertical electrodes are lowered and spot weld the flange to the plate. These welds are made adjacent to four spoke-like embossings that stiffen the plate.

When the four vertical electrodes retract, the weldment is advanced to the unloading station where it comes to rest above a rocking arm shown in process of upward motion in Fig. 5. At the end of this arm is an electro-magnet that is energized to hold the plate while it is being turned over. At the end of its travel, the magnet is de-energized and releases the plate onto an inclined track down which the plate slides. Then, the arm rocks back automatically to pick up the next piece, completing the cycle of the machine. All motions of the machine are inter-locked and occur in correct sequence, following the loading of each pair of parts.

At the end of the inclined tracks, the weldment reaches the resistance welder, Fig. 6, on whose fixture are placed seven nuts, each having three projections. These nuts are placed over locating pins with projections up, after which a plate is laid over the nuts and brought under vertical electrodes that are lowered and weld each nut projection to the plate. This anchors the nuts firmly, so that they cannot turn or come loose when mating screws are tightened in later assemblies.

Other mounting elements required on the plate are three studs necked at one end for fastening into holes already in the plate, after it is transferred by belt to the welder, Fig. 7. These studs are

Fig. 6 — After seven nuts are placed in shuttle fixture, a base plate is located above them, and fixture is advanced under seven electrodes that projection-weld nuts to the plate.

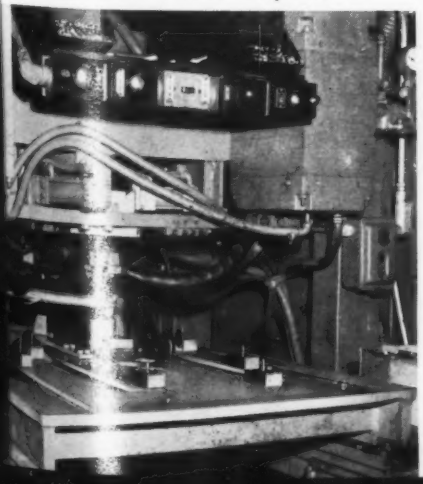


Fig. 7 — Three necked studs are placed in fixture of this machine and enter holes in base plate. When electrodes are lowered, they heat necks and compress them, forming rivet heads that fasten studs securely to the plate.

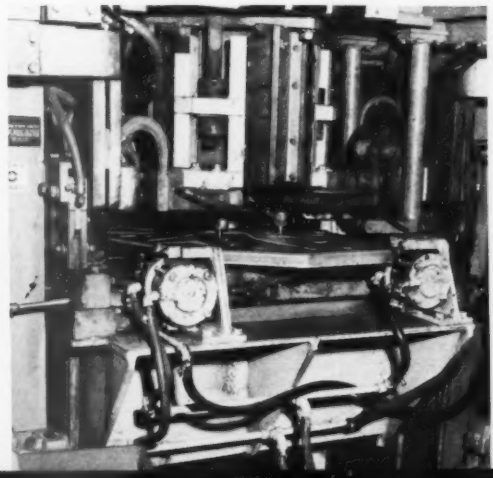
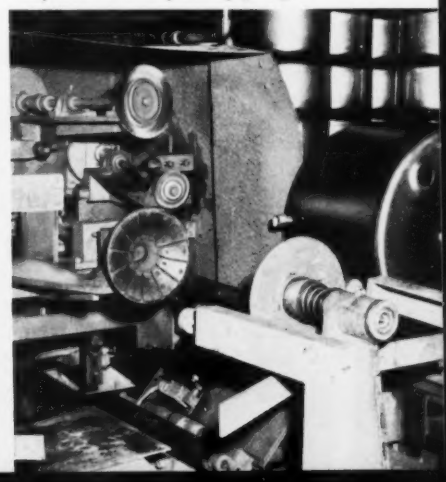


Fig. 8 — Welded tub about to roll from inclined tracks into rocking cradle that advances tub axially into position where rotary wire brushes contact both sides of seam weld joining flange to tub.



For some situations, there's only one finish!

. . . for appliances, that finish is NUBELITE! Manufacturers of appliances or other fabricated metal products should investigate the multiple advantages of Glidden alkyd or epoxy primers and NUBELITE* enamels.

These superior coatings combine the required film-building qualities necessary for maximum impact, abrasion resistance, film toughness and flexibility. They also provide top corrosion resistance, excellent color and gloss retention.

Whether you make appliances or garden tools, bicycles or office furniture, Glidden experience and technical know-how in the industrial coatings field can improve the quality of your product and, perhaps, return considerable savings.

*A Glidden Trade-Mark

GLIDDEN

THE GLIDDEN COMPANY

INDUSTRIAL PAINT DIVISION

900 UNION COMMERCE BUILDING • CLEVELAND 14, OHIO

QUALITY Glidden PRODUCTS

Sales Offices and Factories:
San Francisco • Los Angeles • Chicago
(Nubian Div.—1855 N. Leclaire Avenue)
Minneapolis • St. Louis • New Orleans
Cleveland • Atlanta • Reading
Canada: Toronto and Montreal

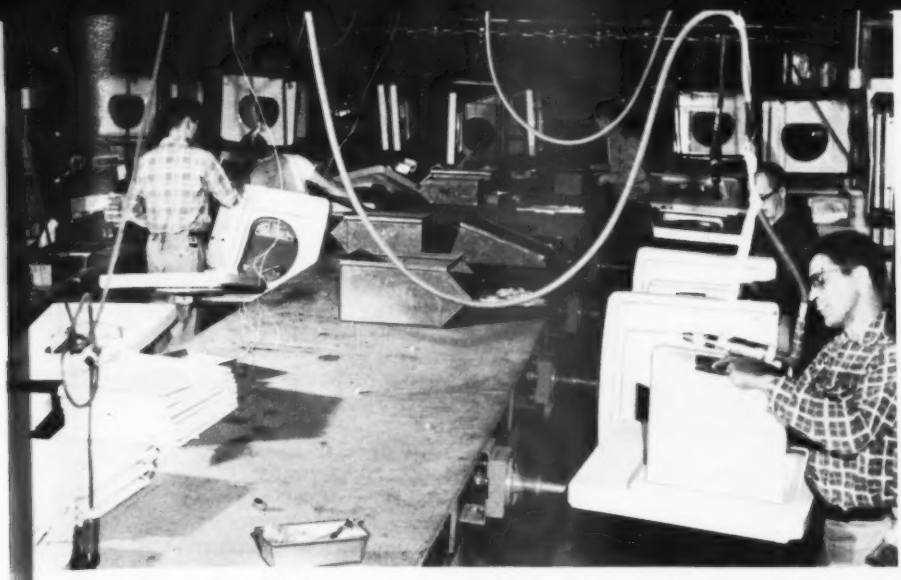


Fig. 10 — View of the new conveyorized setup for assembly of washing machine covers. The chain below the table top advances holding fixtures through stations where successive assembly operations are performed.

set into a fixture on the bed of the welder with necked ends up. Then the plate is applied so that the upper ends project through mating holes, and shoulders contact under side of the plate.

When three electrodes are lowered, they press on the upper ends of the three studs, and current passing through the necks raises them to red heat, making the metal soft enough to yield and expand under continuing, heavy, forging pressure. This results in forming heads like those of rivets, the heads being upset against the plate. It is thereby clamped tightly between the heads and shoulders of the studs. Actually, the machine applies heat in four phases of the welder cycle, much as in riveting, but the pressure is continuous rather than a result of repeated upsetting blows, and is sufficient to produce forging flow of the metal at the end of the welder cycle. Joints thus formed are exceptionally strong.

Thirty-eight per cent increase in production

The fore-going welding and riveting operations require one less man in the line than for prior setups, yet output is 250 assemblies an hour as against 180 an hour before. There is, therefore, a substantial gain in over-all economy.

Washing machine tubs produced in this plant have circular bottoms, each with a narrow drawn flange and recessed portions, as shown in Figs. 8 and 9. Side walls of the tubs are made from strips rolled to circular form with ends joined in a mash seam weld. After this longitudinal weld has been made, the ring is expanded to produce a tight fit inside the bottom flange, and is seam welded to the flange.

Before the tub is coated inside and outside with porcelain enamel, the circumferential seam must be wire brushed to remove any scale or oxide. Fast brushing is done on an automatic basis in the setup, Figs. 8 and 9.

Wire brushing tub welds

After the circumferential weld is completed, tubs are placed in an inclined rack and rolled to the position shown in Fig. 8. There the tubs are discharged, one at a time, into a rocking cradle from which they are pushed axially into brushing position. This brings the circumferential weld between the periphery of a 5″ inside brush and an external 8″ brush of the same make. Both brushes are made from 0.016″ steel wire and are on belt-driven shafts so arranged that the inner wheel is rocked upward and the outer one downward until both contact the seam weld to be brushed.

Central discs, one inside and one outside the bottom of the tub, are brought together axially, gripping the bottom between them, whereupon slow rotation of the tub starts and is continued until brushing of the same is completed. Then rotation stops, brushes are tilted out of contact, the tub is pushed back into the cradle and is released to roll down to a leak-testing station. Another tub then rolls into the cradle, starting a duplicate cycle.

At the test station, a measured quantity of dye penetrant is injected automatically into the tub, and the inspector checks visually to see whether any dye passes through the welds. If penetration occurs, the tub is rejected for repairs. If there is no penetration, the tub rolls into a dumper station where the dye is emptied and returns to a sump. Then the tub is ejected into a piercing station.

Special conveyor for washer cover assembly

Assembly of covers for automatic washing machines formerly was done on tables having carpeted tops designed to avoid scratching of painted surfaces. Operators applied an inner cover, a switch, and moldings, and did not always work in convenient positions. It required nine men to complete 650 cover assemblies a day. Now, eight men, plus one for utility operations, complete 700 assemblies a day, working around a table, Fig. 10, from which inner covers and small parts are taken.

Just below the top of this table is a slowly-moving chain conveyor and tracks for supports, from each of which projects an arm holding a fixture that is locked by a turn of a lever inside the main cover opening, as in Fig. 11. Each fixture is on a ball joint and can be set instantly at any angle to bring the work into most convenient position for each successive operation. Assemblers work close to the fixtures and move along with them while performing whatever operations are assigned to them.

Parts are taken from the table, and the main top from a plant chain con-

to Page 81 →

Fig. 11 — Washing machine cover held by a central fixture which is expanded by a hand lever. Fixture is on a ball joint, and is easily moved to any position convenient for the assembly operation to be performed.

Housewares show buyer registration hit

M P M STAFF REPORT

THE all-time record buyer registration was broken at the recent 28th National Housewares Manufacturers' exhibit, with a registration of 11,100.

The show, which was sponsored by the National Housewares Manufacturers' Association, was held January 16 through the 23rd at the Navy Pier in Chicago. The final total of all registrants was over 25,000. The various products displayed at the show were from 730 manufacturers, an industry record, according to Dolph Zapfel, secretary of the NHMA.

At a press conference opening the exhibit, the officers and directors of NHMA, almost to a man, expressed confidence in future business in the small appliance market. One of the officers pointed out that new products are an important part of continuing good busi-

Above: Herbert Blakeslee, vice president and general manager of Cory Corp., is shown here beside a sparkling array of his company's products. He's holding one of their new electrically-heated casseroles, a product that made its debut at the show.

Left: A remarkable new appliance at the show was this Dormeyer Broil-Well, featuring a choice of three colored finishes. The new finish was developed to match other Dormeyer appliances. Colors available are pink, turquoise, and yellow.

Left: E. M. Robinson, executive vice president, (left), and R. A. Pettit, sales manager, United States Stamping Co., proudly display the company's line of Gourmet porcelain enameled kitchen ware. The colorful decorations are fired on for permanency.

New for Westinghouse at the Housewares show were these appliance centers that enable operation of a number of small appliances at the same time. These panels are made of anodized aluminum and come in the three models shown. They are also fully protected by circuit breakers.

hits all-time high

EXCLUSIVE MPM PHOTOS

ness. He cited the temperature-controlled electric fry pan as an example. Five or six years ago this item had just been introduced. Now it is selling at the rate of about 6,000,000 units a year. He asked who would have been able to predict this enormous growth for an individual product.

Comments received from top executives interviewed at the Housewares Exhibit indicate that sales of small appliances will pick up before six months of 1958 are over. All of the executives interviewed, representing firms manufacturing small appliances, felt that 1958 will be a good year.

New appliances shown

Among the new products shown were an electrically-heated aluminum casserole by Cory, and an electric rotisserie by Dormeyer, employing an organic fin-

to Page 73 →

Above: One of the outstanding new appliances at the show was this rotisserie oven by General Electric. Vice president and general manager of the Housewares and Radio Receiver division, W. H. Sahloff, is very proud of their new product.

Right: With the many handy small appliances that are on the market, General Electric designers conceived this appliance center with a place for each. There is also a control panel complete with timer as shown at the left of the "center." It is only an idea of what could be done, and is not available.

A product that is sure to attract attention at the price shown on the plastic globe is the Universal Coffeematic made by Landers, Frary & Clark. A. W. Bahder, sales development manager, displays item.

Right: Fred A. Genck, manager, national dealer sales, (left), and Ed Ploner, vice president and regional sales manager of Sunbeam, admire the new Sunbeam controlled-heat fry-pan.

Design for a bathroom scale

new scale design combines a plastic "skin," gold anodized aluminum, rigidized metal, oversize glass lens, a Swiss jewel, and a contoured platform

The new Brearley Counselor Classic bathroom scale has been designed to get the best looking scale obtainable, without loss of peak performance. From an engineering standpoint, the operating mechanism has, in fact, been made more efficient. For example, to minimize friction, an imported Swiss jewel is used under the revolving shaft of the dial to get a more accurate weighing. While this feature is not visible to the user, it greatly increases the accurate life of the scale. As some poorly designed scales get older and the parts wear, the shaft may bind, or the movement get excessively "sloppy," so that readings become unreliable.

The external appearance of the housing has been designed to reflect the inner quality of the operating mechanism. The average scale has a top platform of steel into which has been recessed a thin piece of overlay, (linoleum, rubber, or plastic) for warmth to the touch of bare feet. This has always posed a problem because of the difficulty of holding down the edges of the overlay in the highly-humid atmosphere of the bathroom.

To solve this problem, the designers conceived a new method of covering the steel platform with a complete molded plastic shell that would not only cover the top but the sides and ends as well. The material chosen for the plastic skin has extremely tough and somewhat flexible qualities. This "skin" satisfies two needs: it gives the necessary warm touch; and it provides a product not only pleasant to the touch but to the eye as well. The shell is only a cover and does not carry any stress. All stresses are passed on to the shell top which is contoured to fit the shell. The two are held together with adhesive.

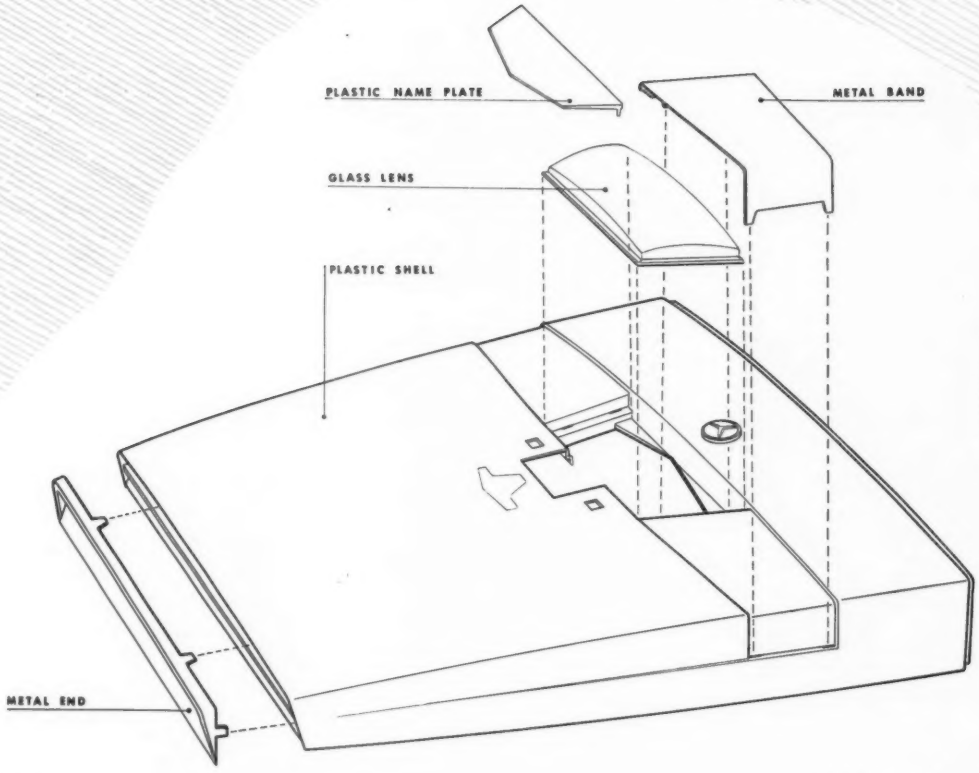
Metals used for "dress-up"

To further "dress-up" the scale, formed aluminum ends are fastened into recesses in the plastic cover. These recesses are obtained by side cores in the die, with holes to receive extended tabs from the formed metal ends. These

An MPM Product Design Feature

The Manufacturer:
The Brearley Company
Rockford, Illinois

Design Consultant:
Palma-Knapp Associates
412 Thatcher Avenue
River Forest, Illinois



tabs are then bent over inside the plastic cover for a simple quick fastening.

The metal band at the top on either side of the dial is rigidized metal (anodized aluminum) and is held in place in the same way as the metal end caps. The plastic cover is recessed to accept these metal bands. The function of the recess in both cases is to receive the sheared edges of the metal. Even though the recess adds to the expense of the mould, it offers such a definite sales advantage that, in the opinion of the designers, it would be not only poor physical design but a poor psychological approach as well to omit it.

The lens is large to admit sufficient light to the dial, and for the user to see more of the dial for easier reading. The housing and the metal bands on either side of the dial opening are designed to hold the glass lens in position. The housing has a recessed integrally-moulded pocket to receive the lens and the metal bands are laid over the lens and fastened as earlier described. The function of the metal bands is really two-fold: one being as a necessary part in assembly; and the other as a decorative element which sets the Counselor Classic apart from other scales.

One of the desirable features of a bathroom scale is thinness, or height from the floor. The Brearley mechanism is extremely thin except that there is a zero adjusting assembly above the dial which needs extra height over the operating mechanism. It is this "hump" that was undesirable.

Answer to "thinness" requirement— a contoured platform

After a great deal of study, the designers achieved the required result by contouring the top, or platform. The platform is gently curved from side to side and from front to back. The high point of the contour is, of course, over the zero adjusting assembly. Sloping down to either side the scale is made actually thinner at the edges (1⅝" to 2⅛") than would have been possible had a flat plane been used over the operating mechanism. As the finished scale is viewed, the purchaser sees the thinness of the edges and is not disturbed by the actual overall height at the center.

This concept of a contoured top naturally raised the question of comfort for the user: therefore, even before the idea was revealed to the client, the designers made a wood model properly contoured to be able to test by standing on the proposed shape to determine its rightness. No discomfort was felt because of the contour from side to side since the curve is relatively flat and is not apparent to the user. The curvature from front to back actually proved to be an advantage since, to read the scale, the body is bent slightly at the middle for easy reading. The slight backward slope makes this bend a natural compensation for the slight shift of gravity of the body.

The scale is produced in pink, blue, green, yellow, and white.

The Counselor presents some new ideas to the scale industry, and will doubtless encourage continued search for new ways to overcome design limitations in this field.

the NEW

TIMESAVER

SPEEDBELT *12*

*Trade Mark

. . . speeds finishing, polishing and deburring operations.

Now, for the first time finishing, polishing and deburring of small metal parts, stampings and forms can be put on a production line basis. The new Timesaver *Speedbelt "12"* equipped with conveyor belt or roller feed tables can be set in the production line to accelerate production and cut unit costs. Deburring jobs on small metal stampings that previously took up to 20 man-hours can now be done in 2 or 3. The *Speedbelt "12"* makes the entire operation automatic, eliminating tedious hand work or operations on back stand machines.

The *Speedbelt "12"* is of the same rugged construction as its larger and well known counterparts; the Timesaver "Speedbelt" Models SPL and TOP. Compact in size, with a 34" feeding height, it can be adjusted for fine metal removal on stock to 2" thick. Abrasive belts can be changed in one minute or less and feed speed is variable from 20 to 50 SFM.

Investigate the advantages of the *Speedbelt "12"* for your shop. Its possibilities for increasing production and cutting costs are unlimited. Write today for folder and prices.

Pioneers in Wide Belt Sanding for the Woodworking Industry

TIMESAVER SANDERS

Box 7446, Robbinsdale Station
Minneapolis 22, Minn.

New rotary mower features die cast shell and components construction

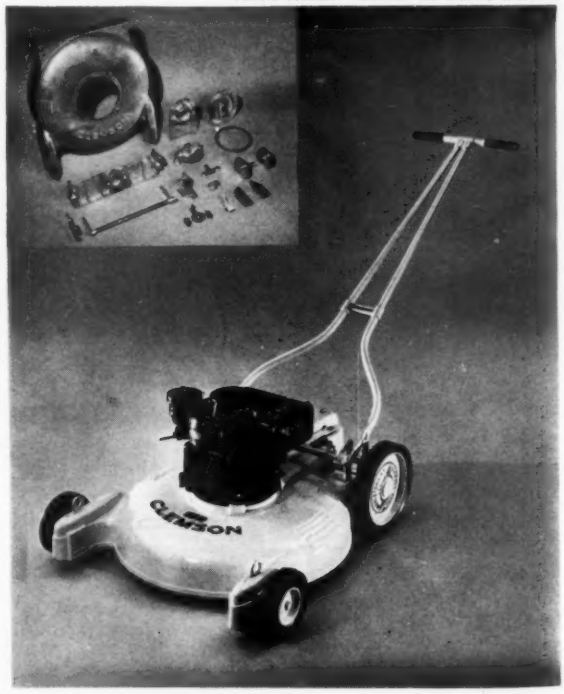
THE die casting process has been used in the design and manufacture of the 21-inch, self-propelled rotary model recently added to the line of mowers produced by Clemson Bros., Inc., Middletown, N.Y. A total of 19 zinc and aluminum die castings comprise the principal assembly components of the new mower, and these die castings are almost ready for assembly as supplied by the custom die casting producer.

The large one-piece aluminum die cast shell is apparent in the view of the finished mower, and the smaller die castings are structural or operating parts assembled under the shell, or in and around the top-mounted engine. A close examination of the die castings reveals the many studs, bosses, holes and recesses, gear and ratchet teeth, and engraved lettering obtained in these components in the casting operation. Secondary operations on the die castings, as received from the job-shop producer, are limited for the most part to simple broaching, drilling, or tapping.

The new Clemson mower boasts a number of unusual features. A rotating disc that spins with the cutting blades under the protective, sturdy die cast shell creates an internal air flow that has a triple advantage: (1) clippings are whirled until completely mulched and spread evenly over the lawn; (2) a down-draft keeps the space between the disc and the under surface of the shell free of clippings; (3) centrifugal force keeps the under side of the disc and the blade free of clippings, even when cutting wet grass. Forward speed is regulated by the position of the handle. When the user permits the handle to move forward, the clutch engages and the mower moves forward only as fast as the user moves. Backing up, when trimming, is accomplished by simply pulling the mower back with no separate operation to release the clutch.

This 21-inch rotary mower is the latest addition to the Clemson line. It is powered by a 2¾-H.P. Briggs & Stratton 4-cycle engine, and boasts many new operational features and maximum safety to the user.

PHOTOS COURTESY AMERICAN DIE CASTING INSTITUTE



These 19 die castings comprise the principal structural components of the new mower. By any other means of production, a greater number of parts would be required and, hence, comparable quality could not be achieved at comparable cost.

Castings by ACME ALUMINUM FOUNDRY CO., Chicago

. . . here's your ANSWER!

MACCO
ALUMINUM CLEANER NO. 19

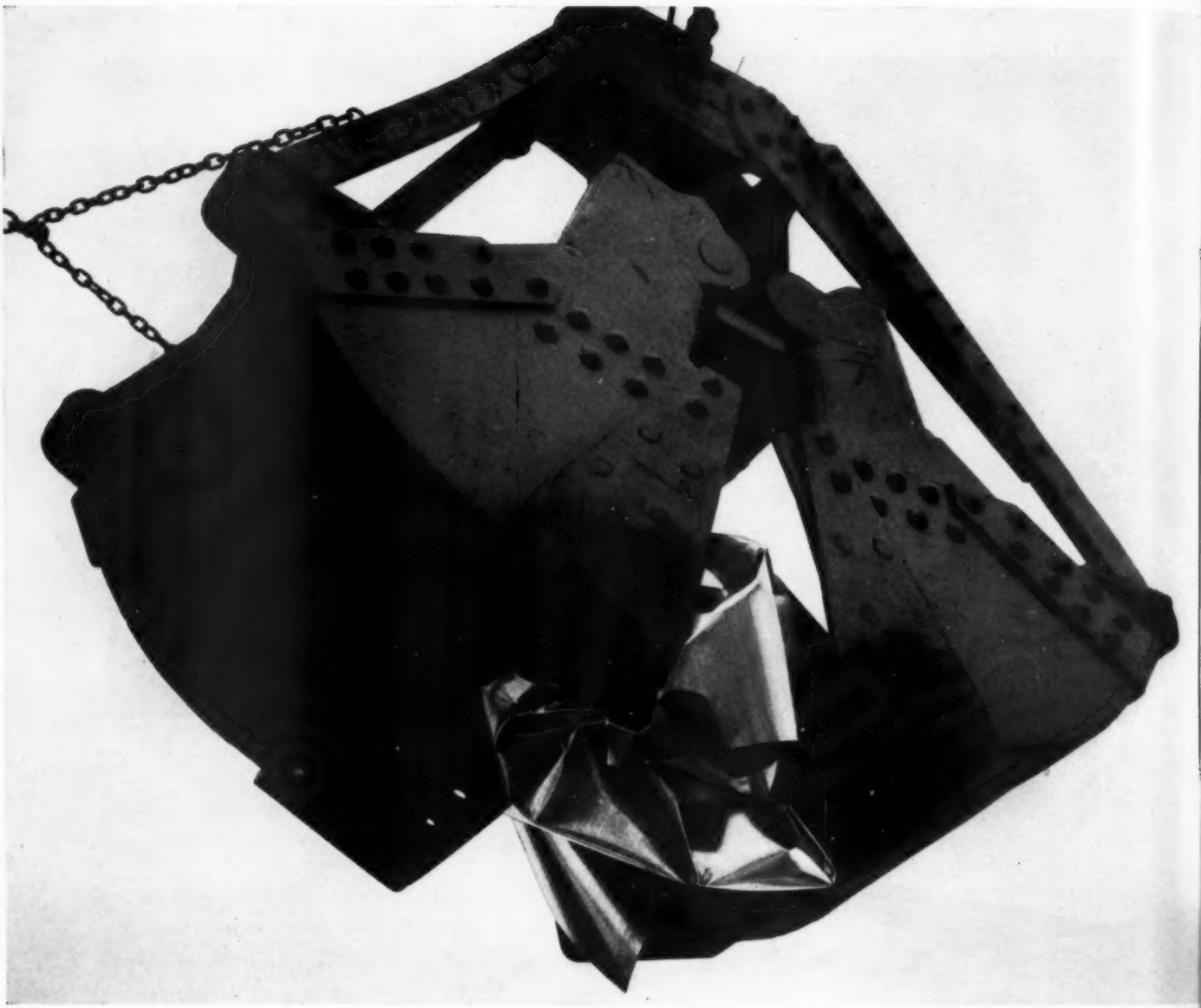
Even the finest organic or ceramic coatings are not satisfactory unless the base metal is CHEMICALLY CLEAN. MACCO No. 19 is a brilliant, new, streamlined 1957 chemical development, *ideal for use in either spray type washer or tank.* This highly efficient cleaner will thoroughly CLEAN and BRIGHTEN aluminum and die cast metal WITHOUT ATTACK. *Just One Operation—No Smut—No Acid Dip.*

simple . . . economical . . . sure

Manufacturers of Better Metal-Working Compounds since 1931

9210 SOUTH SANGAMON STREET • CHICAGO 20, ILLINOIS

MACCO
PRODUCTS COMPANY



SQUEEZE PLAY FAILS TO SCORE AGAINST WEIRKOTE®

Crun-n-n-ch!

For brutal, iron-jawed pressure, a steam shovel has few equals. Here, in this crushing grip, Weirkote's zinc coating undergoes a murderous test.

Yet at every crease, at every tortured angle of this crumpled mass, the zinc remains an integral part of the steel. There is not one sign of flaking anywhere!

No wonder strenuous forming operations such as lock seaming are child's play, for Weirkote can be worked to the very limits of the steel itself!

No wonder parts fabricated from it require no painting, plating or redipping to guard against corrosion. Weirkote parts can be stamped, drawn or spun well in advance of use, and stored without danger of rust.

And NOW, Weirkote is treated to inhibit wet storage (white oxide) stain.

Why not find out what Weirkote's benefits can mean to you?

Free Weirkote Booklet! Send for all the facts on Weirkote. Write Weirton Steel Company, Dept. R-6, Weirton, West Virginia

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

a division of

NATIONAL STEEL CORPORATION

new conveyorized spray installation

enables gasoline pump manufacturers

to increase production,

(in some cases by almost 400 per cent),

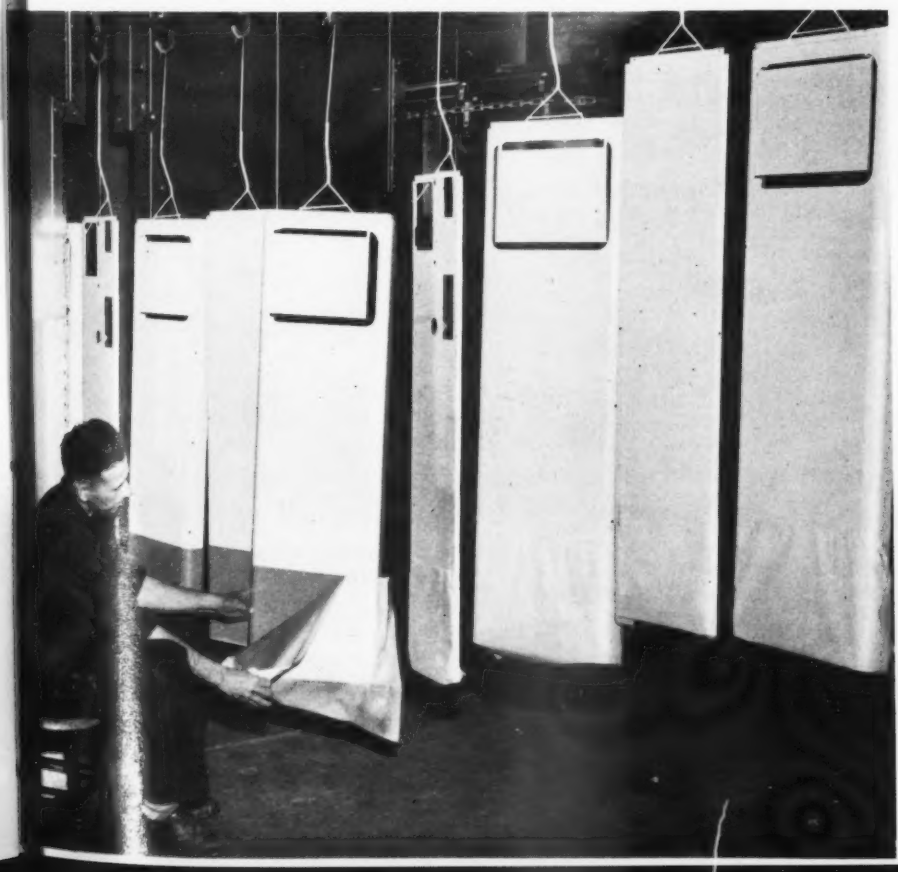
and to save materials

(75 per cent on housings and parts sets)

These three gasoline pumps are typical of the line of pumps produced by Bowser, Inc., Ft. Wayne Div., for many major and independent oil companies.

Modernized paint line helps build Bowser pumps

Masks are removed from housings before painted parts move into oven for final bake.



THE Fort Wayne, Indiana Division of Bowser, Inc. produces approximately a thousand gasoline pumps a month. These include numerous models, such as dual product, single product, high-speed, regular models, remote control units, etc. In addition to the Bowser line, the company produces pumps for many contract customers, each painted in specified identifying colors. Increased production demands in 1957 made it mandatory that a bottleneck in the paint finishing department be removed.

Three hundred colors, nine hundred combinations

On contract work, each customer furnishes painting specifications and, all in all, there are more than 300 separate colors involved. Various combinations run the color total up to over 900. Five or six color changes a day are common in production.

Formerly, the pumps were hand sprayed in three conventional booths.

PHOTOS COURTESY RANSBURG ELECTRO-COATING CORP.

Conveyor for pump housings and parts makes a loop around floor-mounted reciprocating disk. With new setup, one gallon of paint coats seven complete sets of pump panels and parts. Formerly, only four sets were painted per gallon.

The painted parts then were racked on trucks and pushed by hand into a steam-heated oven. It was a slow process. Peak production was about 150 units a day. With the new conveyorized setup, Bowser plant men report that they can turn out twice as many units with less labor and less stock piling.

The change-over to the conveyorized system with electrostatic spraying was accomplished in a week without work interruption. During the changeover some painting was done at night.

Two-day delivery

Under their present production procedure, the company builds, paints, tests, assembles, and ships within two days from the time orders are received in production. According to L. D. McClanahan, general foreman, pump division, it would have been impossible to meet these demands without going to three shifts with their former production set-up.

Parts to be painted are hung in proper sequence on the line to facilitate assembly. One set of parts for a Bowser pump, for instance, includes 2 side panels, 11″ x 50″; two front and back housings, 20½″ wide by 54″; top housings, which are hung 4 to a fixture; 7″ diameter cover plates, which are hung 14 to a work-holder; and the housing doors, which are mounted into the side panels.

Fifteen sets per hour— grows to fifty-five sets

It is now possible to paint, in one hour, 55 sets of housings and parts which go into the pump units. Formerly, with hand spray and limited oven facilities, the line could turn out about 15 sets per hour. Material records show that by the former method, four sets were painted per gallon, and that with the new set-up seven sets are finished per gallon, a 75 per cent increase.

Formerly, it was common practice to sand housings before applying finish coat. The foreman reports that this operation is now unnecessary. Uniformity of coating is credited with this operation change.

Unpainted pieces come either from the fabricating department or, in some instances, from vendors who do their own forming. They first go through a six-stage cleaning process. The first two stages are cleaners; third, a hot rinse; fourth, phosphatizing; fifth, a hot rinse; and the last is a chromate fix.

A 286-foot long conveyor operates from five to eight fpm. Parts are hung on 16″ or 32″ centers, depending upon size, and they first go into a hand touch-up booth, where some are reinforced in recessed areas. Then they move into the electrostatic spray area, where one floor-mounted, reciprocating disk applies primer coat. The disk is 25″ in diameter. If the color run warrants, parts stay on the line after prime bake; paint is changed; and finish coat is applied in the same manner. Indexers on the conveyor line in the spray area turn the parts to coat both sides. After painting, parts move into the gas-fired oven where they bake out at 300° for 15 minutes.

Where production calls for multi-colored pumps (some housings are produced in three colors), parts are removed from the line after priming and masked before putting on the finish coat. Gasoline pumps must be coated to withstand all kinds of climatic conditions. Paint thickness is controlled to within one-half mil over the entire work area. Flexibility in spray application is especially helpful in the two-toned units. From 20″ to 53″ strokes can be used, depending upon parts being painted.

A statement by Paul E. Ganz, president: "Improved manufacturing methods mean better products can be made in larger quantity at more competitive prices. This means increased sales, and employees in the plant where manufacturing processes are kept modern have more security in their jobs. The number of jobs increases, and opportunities for individual employees become greater."

TODAY'S NEW AUTOMOTIVE DESIGNS DEMAND THE BEST STEEL OBTAINABLE

Youngstown Sheets and Strip

Detroit's high-speed automobile body presses are busier than ever turning out body components for today's modern-design cars. More intricate door and fender sections of the new models demand a steel of the highest quality that can take the required deeper draws in its stride. Without question, that steel is Youngstown Cold Rolled Sheets and Strip—the best available anywhere.

Youngstown blends the required combination of surface finish, tensile strength and ductility into every sheet, to provide you almost continuous pressings of even the most difficult-to-form parts. Also, metallurgical quality never wavers from Youngstown's high standards because all operations from ore mining to shipping dock are rigidly quality-controlled by experts with over half-a-century of steelmaking know-how.

On your next order specify Youngstown Cold Rolled Sheets and Strip and join the ranks of our satisfied customers who tell us: "Our production's up—Rejects down—Fabrication costs lowered."

Why not call your nearest Youngstown District Sales Office today, for metallurgical aid or additional information—or write directly to our Home Office.

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices - Youngstown 1, Ohio

District Sales Offices in Principal Cities

Producers of Quality Carbon and Alloy Steels for Over Half-a-Century

QUALITY YOUNGSTOWN SERVICE

there's a Chicago Vit Frit
for every specialized need

ranges

refrigerators

driers

washers

water heaters

sinks

bath-tubs

freezers

architectural

signs

Working side by side with enamel plant personnel is a part of Chicago Vit service that can't be measured in terms of dollars and cents. But it's important to the enamel plant operator, and it encompasses every phase of enamel processing. Chicago Vit customers have learned that this specialized service has helped them to reduce costs and increase production in many ways year in and year out. And the beauty of it all is that it's never further away than the nearest telephone.

FOR FINEST FRIT – CHICAGO VIT

Chicago Vitreous CORPORATION

1425 South 55th Court Cicero 50, Illinois

The photos at the right and above are views of the 58-unit apartment development at Purdue University, Lafayette, Indiana. All of the light-colored areas are 1300° F. porcelain enamel panels processed at Ingersoll Products Div. These panels are a buff color which blends with the face brick on the buildings.

PHOTOS COURTESY INGERSOLL PRODUCTS DIV., B-W CORP.

Low temperature porcelain enameling at Ingersoll

One of the few manufacturers doing porcelain enameling in the 1300° F. range is the Ingersoll Products Division of Borg-Warner Corporation. This is a report of the progress made in a production-size plant operation

MPM EXCLUSIVE FEATURE

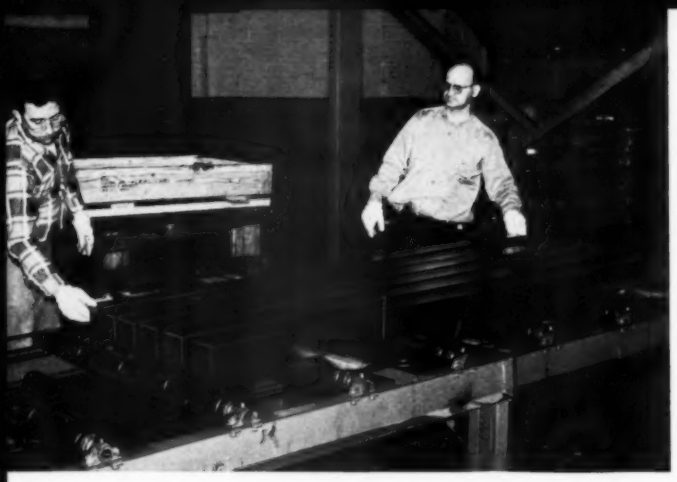
LOW TEMPERATURE porcelain enameling has received much attention in the past few years, but only a few companies have set up production in this promising segment of the enameling industry.

Low temperature porcelain enameling, as considered in this report, is done in the temperature range of 1300° F., which is just below a critical deformation temperature of approximately 1310° F. Below that temperature, metal deformation during firing is very low. This fact has enabled the porcelain enameling of more complicated shapes, thinner gauges of steel, and has practically eliminated warpage.

One of the most active of those companies in the low temperature field is the Ingersoll Products Division of the Borg-Warner Corporation. Located in Chicago, the company has successfully set up a continuous production line for low temperature porcelain enameling of steel, which they are producing under the trade name of Ingersoll-Everon. Important, too, is the fact that it is a production-size operation functioning on a regular schedule.

Products that have been turned out on this line are architectural panels, window sash and door frames, and washing machine consoles. These are items that have been turned out in quantity and do not include products that have been confined to test runs on this production line. This means that the products that have been run in quantity on this line are beyond the experimental stage and, as a result, have proven to be fully acceptable from the standpoint of quality.

The most promising aspect of the 1300° F. process at Ingersoll is the architectural panel field. Here is the meeting of a product that almost everyone agrees will be a bellwether of the building construction industry, with a process that many feel is the answer to



Workmen load cable conveyor which feeds the pickling machine. Parts shown are U-shaped mullions for the Central Sanitary and Office building of U. S. Steel Homes, division of U. S. Steel Corp., Cleveland, Ohio. This conveyor meets with a rubber-covered conveyor that carries parts through the automatic spray pickling machine.

STATEMENT BY *J. H. Ingersoll*
PRESIDENT, INGERSOLL PRODUCTS DIVISION.

Three years ago, it was decided that Ingersoll Products Division would start a comprehensive development program on the use of low temperature ceramic finishes. The Division has for years operated contract stamping and enameling facilities with principal products including washing machine tubs and steel plumbing ware. We felt that the future of porcelain enameling and ceramic finishing could be given added assurance and the market greatly broadened if low temperature coatings (in the 1200 F. to 1300 F. range) could be successfully applied in production.

During the past three years, our engineers and plant men have taken a low temperature program through the early pilot stages and through the "growing pains" phase to a point where, today, we are getting successful production operation at a 1300 F. temperature.

While the greatest part of our production to date has been architectural panels, we have worked with a great enough variety of other products in the appliance and fabricated metal products field to prove the practicability of the lower temperature coatings, and to convince us that the uses for porcelain enamel and ceramic finishes can be broadened as a result of lowering of firing temperatures.

It is our feeling that the enameling industry has an opportunity to successfully broaden the scope of present applications through continued, intensive work on the part of metals producers, frit manufacturers, and operating plants.

One of the most crucial operations in the production of low temperature porcelain enamel is the spray application. The appearance of the slip must be wet to achieve a smooth fired surface.

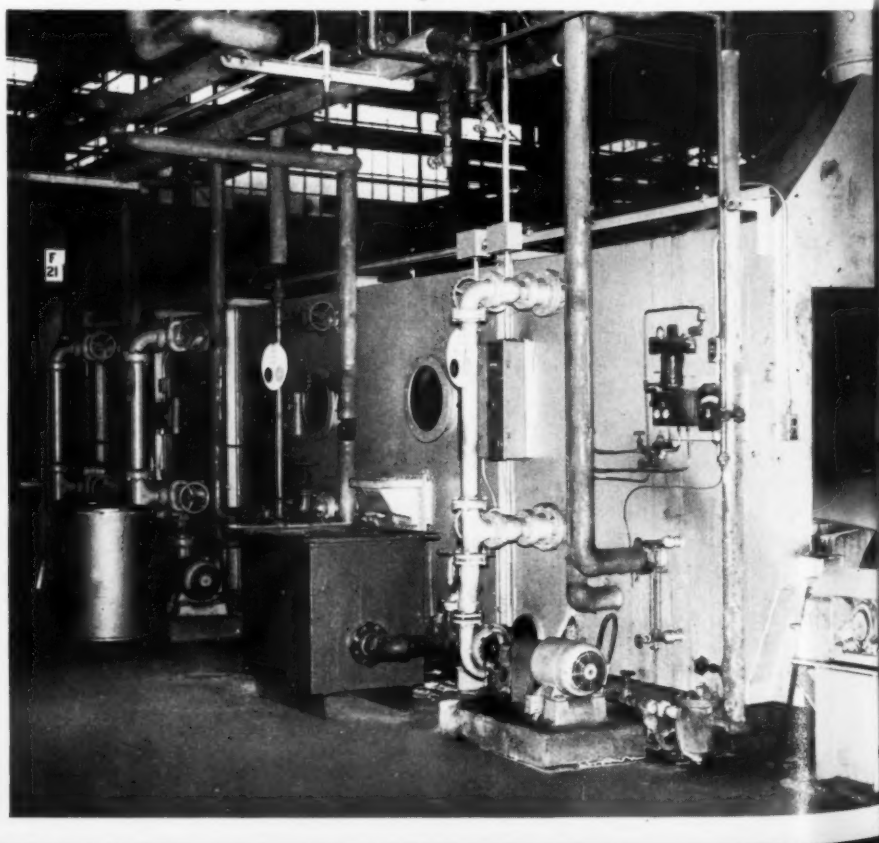
manufacturing flat, distortion-free panels. The metal curtain wall industry is growing extremely fast, and it is continuing to pick up momentum because more architects are realizing the great potentialities that exist. Antiquated building codes are being revised in every major metropolitan center in the country to include metal curtain wall construction. Large, impressive buildings in New York, Chicago, Cleveland, Pittsburgh, Denver and Dallas, and these are not all, have been erected, using metal curtain walls.

Need for modular panels

Practically all of the metal curtain wall buildings that have been erected up to this time have been of custom-made panels, and surely this will continue, for few architects will attempt to copy existing designs. However, there is great promise for the modular panel that can be used much the same as building blocks for structures such as schools, stores and homes. The gasoline service station is a very good example of this type of construction where oil companies have utilized panel modules effectively. The Lustron home is another example, and, though the project failed, many agree that the quality of the homes is excellent. There is every reason to believe that a successful effort could be made in this direction by some aggressive manufacturer.

Ingersoll Products Division has enameled the panels for two building programs which seem to indicate that the manufacture of a modular metal curtain wall unit, that can be used in different buildings, is quite feasible. One of these is the Structo-school, utilizing modular panels that can be adapted to a number of different floor plans according to the requirements of the individual job. Another is a 58-unit residence project on the campus of Purdue University in Lafayette, Ind. The panels for these programs were fabricated by the U. S. Steel Homes Div., U. S. Steel Corp.

This is a view of the automatic spray pickler. It is 140 ft. in length and ten ft. in width. It is completely automatic, with recirculating pumps for the solutions, and continuous automatic testing of the strengths of the solutions. All of the steel that is porcelain enameled at Ingersoll is cleaned in this machine.



Metal cleaning

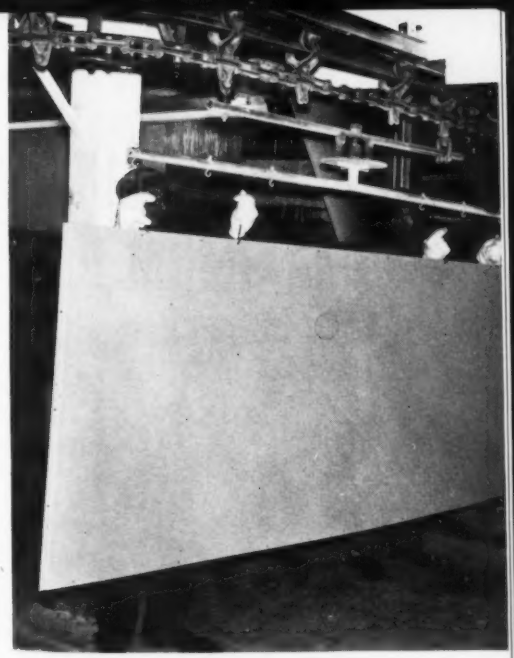
Both hot-rolled and cold-rolled steel are porcelain enameled in the low temperature process. Hot-rolled steel is, at times, cleaned by sand blasting. Window sash is fabricated from hot-rolled steel, and is more efficiently cleaned by sand blasting.

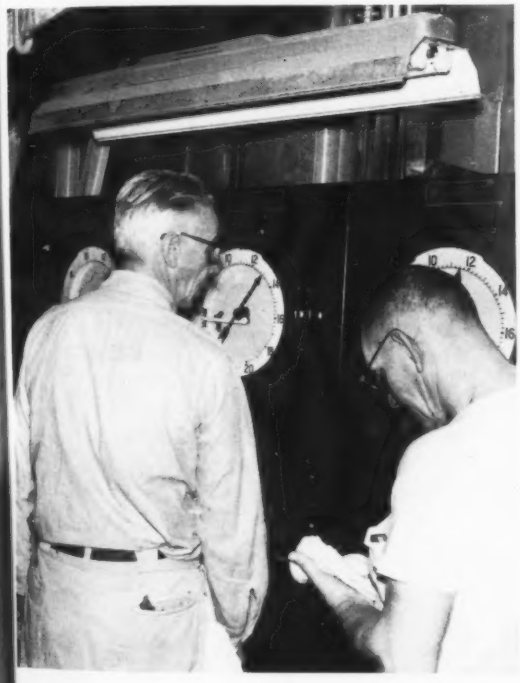
All cold-rolled parts are cleaned in a cable conveyor-type spray pickling machine that is 140′ long by 10′ in width. The first stage is a 1½-minute emulsion cleaner maintained at 185° F. Following a brief cold water rinse, the parts are sprayed for 3 minutes with an alkaline cleaner maintained at 185° F. Next is a 1-1/3-minute hot water rinse, followed by an equal time in a cold water rinse. A sulfuric acid solution of 7 per cent concentration at a temperature of 155° F. is sprayed on the parts for a period of 3¾ minutes.

Next comes a 1½-minute cold water rinse, followed by a 5-minute nickel spray application with a 1.0-1.5-ounce equivalent nickel per gallon solution at a temperature of 150° F. and a pH of 3.3. Then comes a 1¼-minute spray of a nickel rinse at a temperature of 140° F. The nickel rinse is followed by two neutralizer rinse sprays. The concentration of the rinse at the end of the machine is less than at the first. The final spray temperature of the neutralizer is 160° F., and the time of rinse is 3 minutes.

All of the parts to be spray pickled are loaded and unloaded by hand. In the same motion of being unloaded from the pickler, the parts are hung onto specially designed horizontal rods 9 feet in length which, in turn, are suspended from two swivel connections spaced 6 feet apart to permit negotiating turns. The long horizontal rod has a number of holes drilled in it to permit hanging hooks to accommodate any size or type part. Although the hanging tools used for spray application of the enamel and for firing are on different conveyor lines, they are the same in design and material. The only difference is in the type of tooling used for suspending the window sash and the mullions while being fired. These will be described in the section on firing.

The panels are hung from the horizontal rod by means of S-shaped 3515 nickel-chrome-steel hooks. These hooks are used to suspend the panels to be enameled from the time they are unloaded from the pickler until they are ready to be packed. The panels are transferred from the dryer to the furnace conveyor on these same hooks. Type 430 stainless steel is used for the horizontal bars as well as the rest of the hanging tools. The S-shaped hooks are used to suspend the window sashes and the mullions right up to firing.



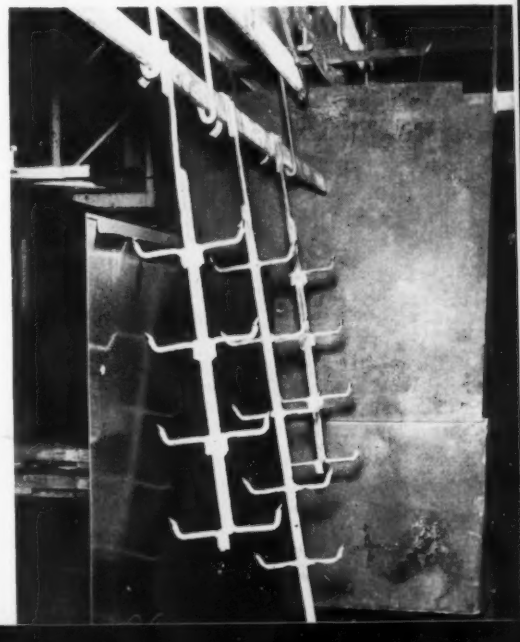


Above: These men are transferring a panel, which has just emerged from the dryer, to the furnace chain. The panels are hung with U-shaped hooks.

Left: A view of the furnace control panel. Both ground and cover coat are fired in the same furnace, although not at the same time. The burning zone of the furnace is 57 ft. long. No changes were made in either the furnace or the controls when the decision was made to reduce the firing temperature from 1500 to 1300° F.

EXCLUSIVE MPM PHOTOS

Below: All shapes other than straight panels are hung on these specially-made burning tools. The tips of the hooks are pointed in a wedge-like fashion to minimize the strain lines on the part at the point of contact. Mullions, window sash panels with flanges like the one shown, are hung on these hooks.



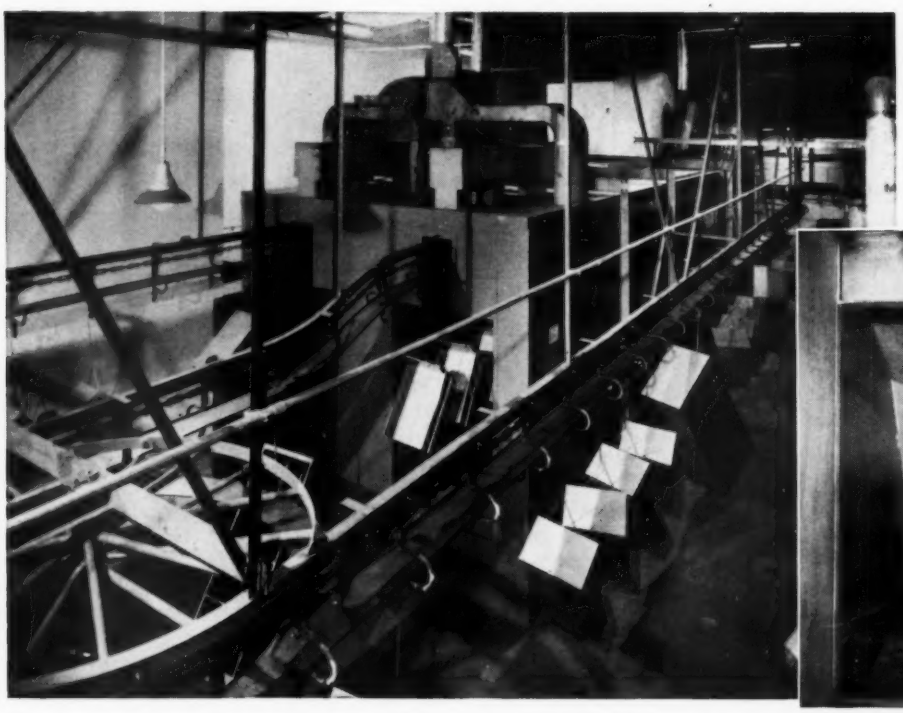
Application and drying

All of the parts coming from the pickler are dried, prior to application of the enamel, in a gas fired convection oven maintained at 300° F. Approximately 700 to 800 pieces per hour can be dried in this oven.

Application of the enamel is done by hand spraying. It is absolutely essential that the slip be applied in a wet state; that is, when the slip is being applied to the surface of the part, it can never have an appearance of being dry. The reason for this is that when the surface of the freshly-applied slip is anything but in a glossy appearing, wet state, the fired appearance of the enamel will lack gloss. At higher temperatures, the surface of the enamel would gloss out, but at the lower temperature the surface of the bisque must be as smooth as possible to insure glossing out. This same effect has been observed by other manufacturers working with low temperature enamels.

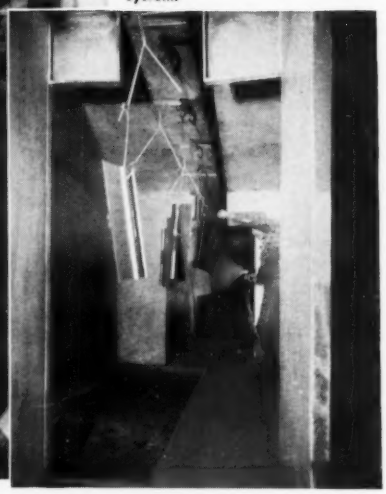
In milling, the only difference between conventional preparation and that of the low temperature enamel is finer grinding. One to three grams on a 325-mesh screen is the test used to insure

THIS DESPATCH FINISHING SYSTEM PROVIDES MAXIMUM PRODUCTION with MINIMUM MANPOWER



Overhead conveyor (photo at left) carries component parts 500 feet through a three-stage washing cycle, a drying oven, a paint spray booth, and the bake oven shown here.

Spray booth (lower photo) where each part is painted from opposite sides, features two water curtains and an air replacement system.



Semi Automatic Operation Speeds Work Flow for Office Furniture Manufacturer

Fifty thousand pounds a day production with only nine employes—that's the potential for the DESPATCH Finishing System recently installed in the new 37,000-square-foot Art Steel Company, Inc., plant at Los Angeles, Calif.

Consistent surface texture, even color, with a finish that is neither soft nor brittle and well bonded to the metal, are basic requirements for high quality in the manufacture of high quality steel office furniture. Only accurate timing and temperature controls, possible with DESPATCH equipment, are equal to the job. The custom-built installation shown, above, was planned to meet all requirements.

Occupying only one-sixth the total plant area, reliable DESPATCH equipment keeps production moving through each finishing stage with less than one hour required for the entire finishing operation.

Maybe you are launching a new product . . . or wish to pep up appearance of an existing product. Whether you sell to industry or Mr. and Mrs. Consumer, let DESPATCH's experience in evaluating, recommending and creating completely engineered finishing systems help solve *your* particular problems. There's a DESPATCH-trained resident engineer near you!

Write today for Bulletin 51

16 colorful pages on modern ways to achieve better finishes, faster production and smoother handling of metal products . . . at lower cost.

DESPATCH OVEN COMPANY

619 S. E. Eighth St., Minneapolis 14, Minn.
Sales and Service in All 26 Principal Cities

DESPATCH

PIONEERS IN ENGINEERING FINISHING SYSTEMS FOR INDUSTRY

the preparation of an enamel that will gloss out in firing. The slip is passed through an 80-mesh screen to remove particles that would otherwise show through the surface of the somewhat thin coatings that are applied to the panels and other parts.

All of the parts are sprayed so that the final fired thickness is as follows: 2 to 2.5 mils for ground coat, and 5 mils for the cover coat. On the basis of a specific gravity of 1.76, the gram pick-up rating works out to approximately 30 to 35 on a wet basis.

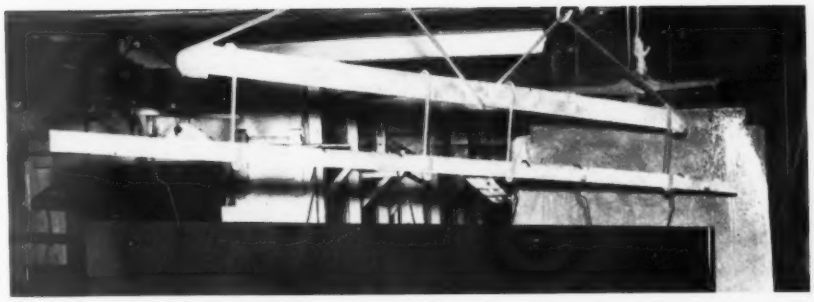
Approximately a 6 to 8-inch distance from the ware is maintained by the spray gun operators for the best results in obtaining a "wet" surface. On panels, the motion of spray used by the operators is vertical, finished off with a horizontal "fill in" spray to avoid streaking where the vertical spray motion applied the slip.

Immediately after the slip is applied, the parts are dried to the bisque state in a gas-fired convection oven at 300° F.

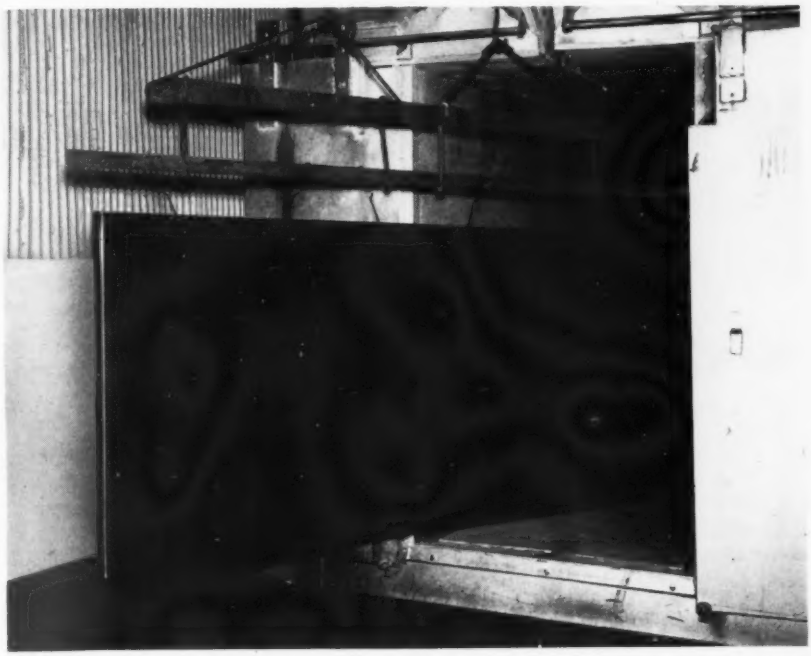
Firing in conventional furnace

The only parts that are not transferred with the S-shaped hooks from the application-drying conveyor to the furnace conveyor are the mullions and the window sashes. These parts are hung on specially made "tree"-type tools that have a series of hooks attached at right angles to the main shaft of the tool. The end of each hook is pointed in a wedge-type fashion to permit hanging of the window sashes and mullions by the inside corner of each part. In this way, the parts can be hung so that a minimum amount of strain line potential is created around the spot where the parts are hung. If a larger contact were made with the part to be enameled, a discoloration mark would appear in that spot. Another possible result would be a differential in expansion of the enamel in that particular spot in relation to the enamel surrounding it. This would result in a tendency for the enamel to spall off at that spot.

Ground coat is fired in the same furnace as the cover coat by staggering the schedule — one day ground coat is fired, and the next day cover coat is fired. The former is fired at 1310° F., and the latter at 1300° F. After the ground coat is fired, the parts are transferred to the adjoining application conveyor for cover coat application. The furnace used is a gas-fired, full-muffle straight-through type, with a 57-foot long firing zone. Baffles made of stainless steel are hung on the conveyor line to help retain as much heat in the furnace as possible. These baffles are spaced approximately 20 feet apart. Installation of these baffles has made it possible to increase the furnace chain speed slightly.



These S-shaped hooks enable production of flat panels. Note how the hooks are positioned to distribute the load uniformly, insuring a flat panel.



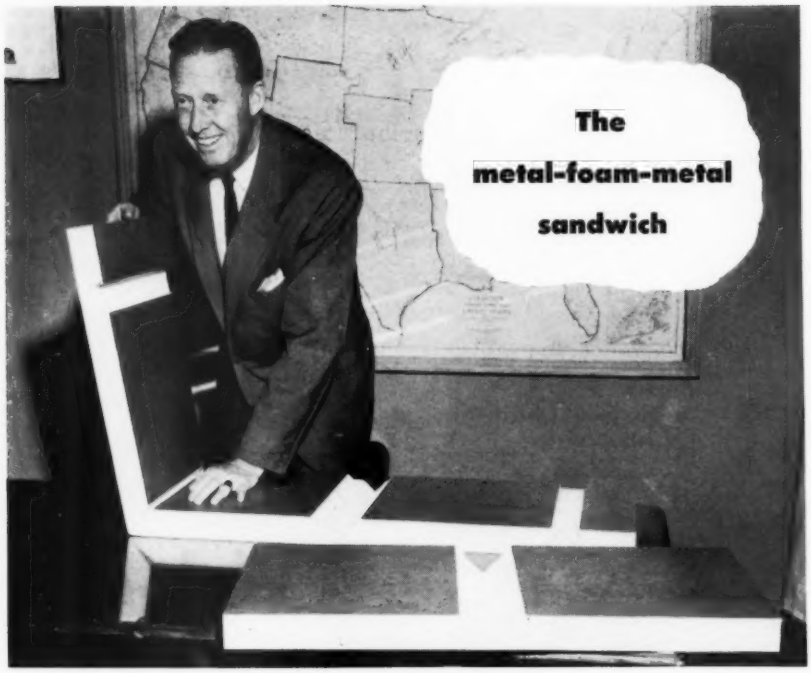
This panel shown emerging from the furnace measures 8'-5⅞" by 3'-9"½. The panel emerges from the furnace with an extremely flat surface over the entire area. The color of the cover coat on this panel is red.

The chain speed, of course, varies with the gauge of the steel being fired. The speed range is as follows: for 16 gauge, 5.7 feet per minute; for 22 gauge, 8.9 feet per minute. The gauges of steel most commonly processed at Ingersoll range between 16 and 22. When washing machine consoles were being enameled, a chain speed of 8.0 feet per minute was used.

Cross section dimensions of the furnace are 4 feet in width by 7½ feet in height. The furnace was originally designed for firing at 1500° F. but no changes were required on the switch to 1300° F. The response of the controls is said to be very good.

The result of the experience and know-how built up by the engineers at Ingersoll is the production of a truly-flat panel and warp-free mullion or window sash that meets the architect's specifications. Weather resistance and gloss retention ability will remain high, it is claimed by the laboratory at the plant, because AA acid resistance can be maintained on colors without red in the composition, and A acid resistance on those colors containing red.

The editors of MPM wish to thank the following Ingersoll Products Division personnel for their help in preparing this article — Blaz Lukas, Factory Manager; Anthony Kupka, Porcelain Enamel Department Manager; Arthur Leake, Porcelain Enamel General Foreman; Howard Russell, Ceramic Engineer; Glen Lynn, Process Control Manager; and James Radcliffe, Sales Product Manager for Special Products.



R. B. Evans, president of Haskelite Mfg. Co., Grand Rapids, Mich., uses miniature model to demonstrate "sandwich" construction for appliance cabinets. (See "Metal-foam-metal sandwich construction," January MPM). *The panels, made of foam plastic bonded between metal faces, have a high insulation factor, are light, easy to fabricate, and are represented as being immune to corrosion and moisture absorption. Haskelite's sales force is being equipped with these models.*

Miniatures enable sales force to bring product to plants for quick demonstration and analysis

HASKELITE, producer of "sandwich" freezer and refrigerator cabinets, is equipping its sales engineers, nationwide, with these novel miniature models.

In calling on engineers, designers, and executives of refrigerator and freezer manufacturers, Haskelite sales representatives bring the product to them, assembling the models in a few seconds. Then they've got a real talking point. And materials going into construction of the refrigerator and freezer cabinets can be examined or tested then and there by the potential customer.

Extra mileage from these novelty "self-sellers" or "silent salesmen" is gained by using them in plant demonstrations, when customers come in to get engineering specifications, and in national trade show exhibits.

Whether at trade show, company plant, or prospective customer's office, these realistic and authentic refrigerator shells offer immediate appraisal of materials and workmanship going into the full-size units. The viewer notes the thick core-insulation of foam styrene, bonded between facings of metal (in this case, aluminum). Some models have other combinations of metal-foam-metal and metal-foam-plastic.

Chief advantages claimed for this type of refrigerator or freezer cabinet, company officials point out, are the high insulation factor, the "feather lightness" of cabinet weight, durability of materials, immunity to corrosion and moisture absorption, and ease of prefabrication and assembly into finished products by the appliance manufacturer. A quick change of design is possible without expensive tooling.

These refrigeration units are being produced in both vertical and horizontal models, to stand freely when finished by the appliance manufacturer, or to be built into a wall.

Photo on left: Demonstrating ease of "assembly" with prefabricated metal-foam-metal sandwich sections

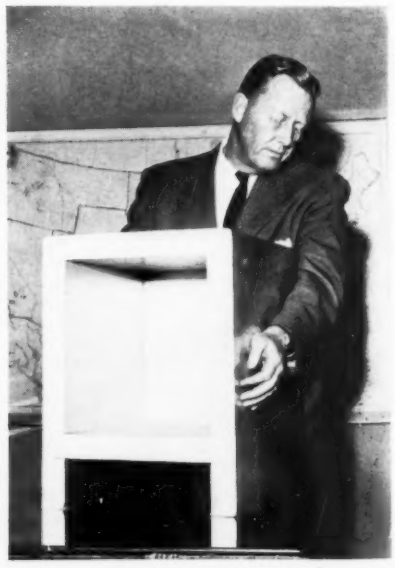
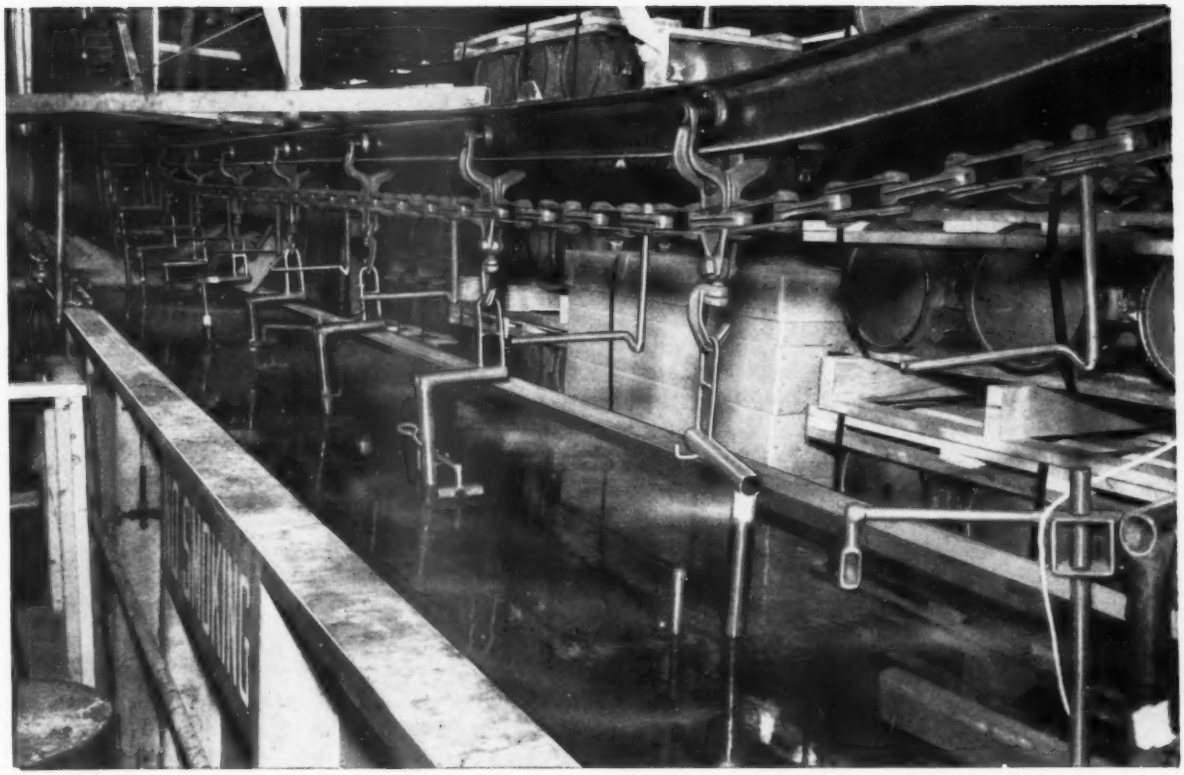


Photo on right: President Evans shows the completed appliance cabinet minus door, trim, and hardware.



PAINT REMOVING COMPOUNDS BY KERNS

If you have a paint removal problem contact Kerns. Whether your particular problem requires a Caustic-type, Solvent-type or Flush-off type stripper a Kerns technical service representative can help you.

As manufacturing chemists and producers of *specialized* compounds, we offer our technical services to the appliance and fabricated metal products field. Phone for a personal contact or mail the details of your problem to our Technical Service Department for *quick action.*

PRODUCERS OF:

Drawing Compounds—Cutting Compounds—Forging Compounds—Grinding Compounds—Phosphatizing Compounds—Wire Drawing Compounds—Rope and Twine Compounds—Cleaning Compounds—Cling Oils —Rolling Oils—Rust Preventives—Wire Rope Lubricants—Specialized Greases—Spray Booth Compounds.

L. R. KERNS COMPANY
2659 East 95th Street **Chicago 17, Illinois**

Subsidiary Plant

KERNS PACIFIC CORPORATION
630 N. Batavia Street **Orange, California**

Offices in principal cities throughout the U. S. A.

A. W. Slocum, B. A. Malm, and S. U. Greenberg reflect optimism over the trend toward color in industrial finishes.

MPM EXCLUSIVE FEATURE

Before taking up the question of color, Mr. Greenberg made the comment that, in connection with his public relations work with the National Paint, Varnish and Lacquer Association, consideration is being given to the question of terminology for industrial finishes as contrasted to finishes for the home. It was pointed out that industrial finishes consist of baked chemical coatings which have very little relationship to the linseed oil finishes used in the average home. The baked coatings are impervious to most chemicals, are extremely flexible, hard, and non-dust-collecting, and are not comparable to house paints, either in formulation or end-use characteristics.

Question: When, in your opinion, did the present trend to color begin?

Mr. Malm said that he felt the last ten years had shown a trend in the direction of color. Mr. Greenberg pointed out that, after cars went to color from the standard black, there was a start of a trend in a variety of other metal products. Mr. Slocum mentioned the fact that after World War II there was a definite trend of color in all metal products, and that the appliances were not the earliest in this, but it was inevitable that they should join the trend.

Question: Are there any industries you serve where the trend to color is more pronounced?

Mr. Slocum's opinion is that there is no outstanding group in the metals field that is more conscious of color; it is more or less of equal interest throughout the metal products field. Mr. Malm points to central heating plants,

EDITORIAL NOTE: S. U. Greenberg has been president of United Wallpaper, Inc., since August 1, 1956. He came to the organization from Sears, Roebuck and Co., where he had been general manager of the paint factory division. Previously, he served as general manager of the Pacific Paint and Varnish Co., Berkeley, Calif.; technical director of Dorward and Son, Richmond, Calif.; and as chemist with the California Ink Co., Berkeley. Greenberg graduated from the University of California with the degree of B. S. in chemistry. He is a member of the Executive committee of the National Paint, Varnish and Lacquer Assn., Oil Chemists Society, and the American Chemical Society.

B. A. Malm joined United Wallpaper as vice president of paint operations on August 1, 1956. He came from the paint factory division of Sears, Roebuck and Co., where he served successively as assistant buyer, buyer, senior buyer, and operations assistant. Previously, he had worked as a research chemist for the Victor Mfg. and Gasket Co., Chicago. Malm was awarded a B. S. in chemistry by Bethany College, and an M. S. in chemistry by the University of Kansas.

A. W. Slocum has been sales manager of the Illinois Paint Works since December, 1952. He was formerly industrial sales manager. Prior to joining the Illinois Paint Works, Slocum had been sales manager of the refinish division of the American Lacquer Solvents Co., Phoenixville, Pa.; owner of Kitchen Cabinets, Inc., a Clinton, N. J. manufacturing firm; and general sales manager, secretary, and a director for the Beckwith-Chandler Co., Newark, N. J. He studied business administration at Columbia University.

Where is COLOR heading in the metal products field?

a Dictet interview with S. U. Greenberg, president, and B. A. Malm, vice president in charge of paint operations, United Wallpaper, Inc., and Arthur W. Slocum, sales manager, Illinois Paint Works, Div. of United Wallpaper, in the executive offices of the parent company

space heaters, and lawn mowers as some of the products that have gone to color, either for the purpose of better fitting into the home, or to supply a sales advantage. Office machines, he said, have been outstanding in the development of colors that are harmonious with office environment.

Question: What color or colors are most evident among your customers in the metal products finishing field?

Mr. Slocum points out that the pastel shades, common in the appliance field, are still on top. Yellow, pink, green, and blue are the prevailing favorites together with the ever-present white finishes. Mr. Greenberg pointed to the choice of the softer colors, even for such equipment as power mowers, in contrast to the bright reds or greens which might normally be associated with this type of product. He feels that, psychologically, the latter are associated with heavy farm equipment and, consequently, heavy work. This, of course, is reverse psychology as far as the sale of a home mower is concerned.

Question: Does the type of finish limit color possibility?

Mr. Malm suggests that some "wrinkle" and hammered finishes are not suitable for white and have some limitations for color; it is sometimes difficult to get a "clean" pastel shade, while in the darker shades the wrinkle finishes are very effective. Aside from some of these specialized finishes, it is possible to get any desired color or shade with modern industrial finishes, and with the color pigments available.

Question: Do you feel that the psychological effect of color has had an important part in the present trend?

Mr. Greenberg feels that following World War II, one of the chief factors in bringing color into the picture may have been the desire to get away from the depressing effects of the war situation; in other words, to bring some brightness and cheerfulness into everyday life. Reference was made to the therapeutic effect of color in a hospital. It was also indicated that some homemakers may prefer mixed colors in the kitchen equipment and other metal products, rather than to use a kitchen in all one color, such as yellow or any other single color. In a sense, this may reflect a "sameness" as in the case of an all-white kitchen.

Question: What difference, if any, do you see between the current color trend and the trend that took place during the early '30s?

It was pointed out that the moving from the black automobiles was first to the darker or deeper shades of color. Mention was made of stove or range tops with marbelized effect as a typical color effect used in the home during the early 30's. Mr. Malm points out that today's color trend is entirely different from the other one, in that producers are using a scientific approach, both from the standpoint of the development of colors used, and in the marketing of these colors. The earlier color trend, he feels, bore no relation to marketing techniques. In addition to metal products, floor covering, home decorations, and everything of this nature enter into the picture on the basis of harmonious use. Mr. Malm feels quite definitely that color is "here to stay" as opposed to the earlier trend, which lasted only a few years for the reasons indicated.

Question: Is color limited by shape or size of the product?

Those interviewed are in agreement that the larger the product, the greater must be the care in the use of color. Principal objects in a room gain (by their size) a great deal of attention, and cannot be extreme in color without becoming undesirable. Smaller accent products or objects, on the other hand, can carry the brighter colors easily. There appears to be no limitation to the size of the product that can take *some* type of color.

Question: Does the "do-it-yourself" trend effect the use of color?

Mr. Greenberg states that there is a very definite result in that, where it was formerly considered necessary to use an interior decorator for choosing colored products for the home, television, women's magazines, textbooks, etc., have eased the fear of using color for the average housewife. While "Mrs. Gotrocks on the hill" must, of necessity, still have a high style decorator to take care of her home decorating problems, a large majority of homemakers now feel competent to set up a color scheme for their own home.

Question: What part has chemistry and basic materials played in current trends?

Mr. Malm states that the development since World War II in organic chemical pigments has been such as to stabilize organic finishes from at least three angles. *One* — the effect of heat and processing; *two* — the ability of modern finishes to withstand any type of chemicals ordinarily found in households or in industrial use; and *three* — the uniformity of color (as sensed by the eye) under various types of light such as natural sunlight, fluorescent, or incandescent lighting.

to Page 76 →

ROSS
Air Systems

Engineered Atmospheres for Better Processing

A ROSS METAL DECORATING PROJECT

View shows an example of ROSS SERVICE in the field of metal decorating. This Ross Oven is being used for baking, curing, cooling or converting of decorative coatings, enamels, inks and varnishes on lithographed metal sheets.

How Ross Serves in the Fields of:
BAKING • CURING • COOLING • CONDITIONING
DRYING • PAINT FINISHING • VENTILATING

In these operations, we are dealing with many variables. We are dealing with such factors as air, circulation, impact, temperature, moisture, solvent vapors, surface contact, penetration, absorption, zoning that go to make up a processing 'atmosphere'. It's more than air conditioning. It's creating a favorable working atmosphere.

Our first step is to study the problem with the cooperation of the customer's personnel; next to design the system and integrate all the necessary units to produce the desired results; then to manufacture and install. The desired end-product is the target. We design and manufacture to hit this target at the lowest possible overall unit cost.

Literally thousands of Ross units and systems of different types have been installed to provide Engineered Atmospheres in such industries as pulp, and paper, metal working, textile ceramics, foundries, pharmaceuticals, food processing, plastic processing and converting. The consistently successful operations with these many systems and units can be traced directly back to skill in design and durability of construction.

When you call on Ross Engineers to discuss a problem confronting your engineering and production personnel, you will in effect be calling upon more than thirty five years of experience in the design and installation of systems and units to provide the best 'working atmosphere' for producing the desired end-product in operations such as those listed in the heading.

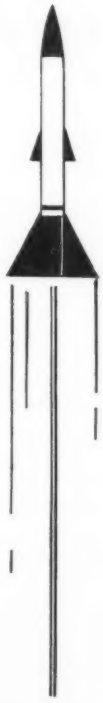
THE ROSS GROUP OF COMPLEMENTING SERVICES

J. O. Ross Engineering, New York
Andrews and Goodrich Division, Boston
Ross Engineering of Canada Limited, Montreal
Ross Midwest Fulton Corporation, Dayton
Carrier-Ross Engineering Company, Ltd., England
John Waldron Corporation, New Brunswick, N. J.

J. O. ROSS ENGINEERING
Division of The Midland-Ross Corporation

444 Madison Avenue, New York 22, N. Y.
ATLANTA • BOSTON • CHICAGO
DETROIT • LOS ANGELES • SEATTLE

when the time comes...



for new and better glass products — whether it be today or 2000 A.D. — Marsco's craftsmen engineering team will develop them.

The Junior Spaceman above has the best in interplanetary protection — a glass space helmet — because glass can be bowed to fit any desired shape and yet it can be tempered to impart extreme resistance to impact.

You or your family don't need space helmets today but chances are glass could improve the utility and beauty of your product and make it more salable today.

Let Marsco's craftsmen engineering team impart to your product all the advantages of glass.

ask for the man from

Marsco

Here are some of the applications for Marsco heat-treated, tempered and hardened glass parts:

- CLOCK & TIMER CRYSTALS
- OVEN DOORS
- RADAR EQUIPMENT
- AIRCRAFT ACCESSORIES
- PHOTOGRAPHIC EQUIPMENT
- LIGHT LENSES
- DIALS & NAME PLATES
- TELEVISION EQUIPMENT
- INSTRUMENTS
- MEDICAL EQUIPMENT

Special shapes for: Instruments, Gauges, Household and Industrial Appliances.

MARSCO MFG. CO., 2909 S. HALSTED ST., CHICAGO 8, ILL.

NORTHWEST
LEADS THE WAY WITH CHEMICALS FOR USE WITH
ALUMINUM

If you work with aluminum you'll be interested in Northwest's outstanding line of chemicals for use with modern alloys. Northwest's continuing research and development program has earned them the reputation of "First with the best" in this rapidly developing field. It will pay you to investigate:

REMEMBER!

"Your cost per finished article is the true cost of your cleaner."

- **ALKALUME CLEANERS**—A full line of cleaners and etching compounds especially formulated for use on aluminum alloys prior to plating, anodizing, painting or welding.
- **ALKALUME PRE-PLATE**— An especially effective zincate bath for preparing aluminum for plating.
- **ANOSTRIP**—An easily handled liquid product, excellent for stripping anodic film from aluminum surfaces and racks without damage.
- **ALKALUME DS**— An efficient, economical, 100% active product for removal of etching smut at room temperature.

Northwest products are manufactured on the West Coast by
ALERT SUPPLY COMPANY, Los Angeles

NORTHWEST CHEMICAL CO.
9310 ROSELAWN DETROIT 4, MICH.

part II contains information on the tasks that can be done with infra-red heating equipment

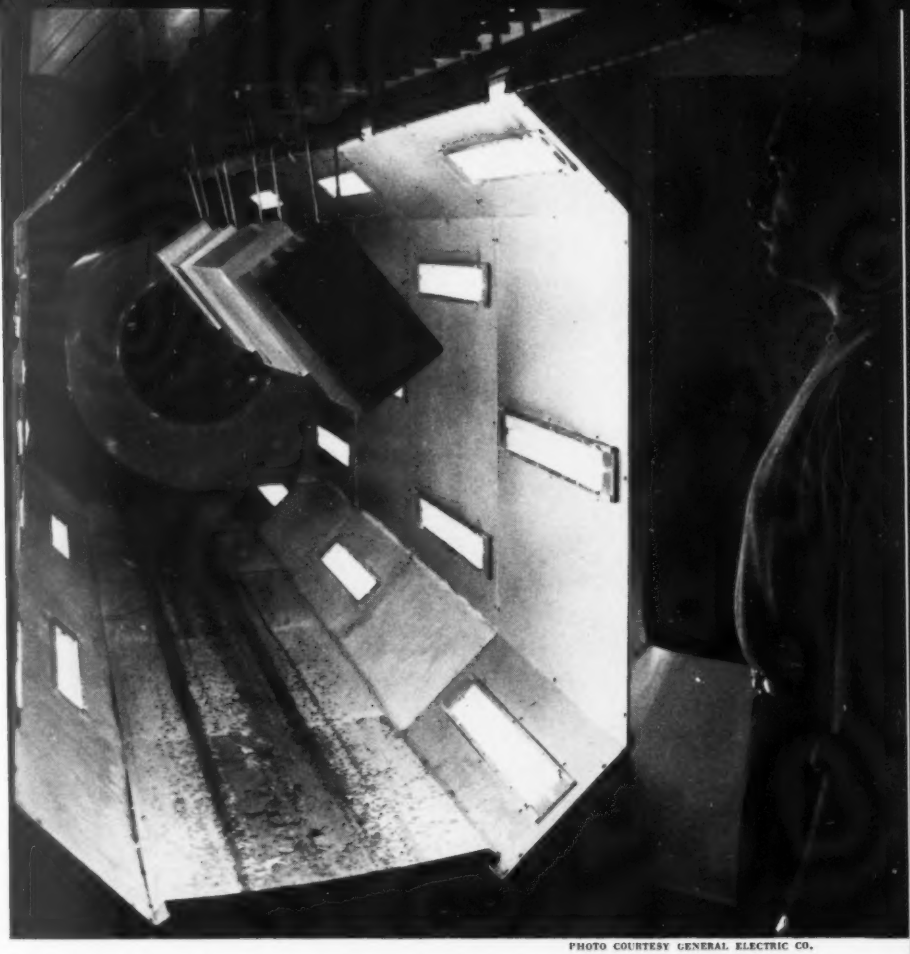


PHOTO COURTESY GENERAL ELECTRIC CO.

This photo shows the use of a tungsten filament in a quartz tube used for drying organic finishes.

Infra-red heating does many jobs in the metal products field

by John Sincere • TECHNICAL EDITOR

MPM FEATURE

Practically any task requiring heat below 700° F. can be accomplished with infra-red equipment. The variety of equipment available enables the plant operator to apply heat efficiently to many processes, from baking paint on a railroad locomotive to degreasing electric toaster parts prior to chrome plating, or dehydrating refrigerator coils.

Either custom-engineered infra-red heating units or components of infra-red heat sources are available. If a process requires a constant source of heat for a product of unvarying size, then any one of the suppliers of infra-red equipment can design a unit especially for the task. On the other hand, if a manufacturer needs heating equipment for a variety of sizes of products, then he can obtain flexible units that can be adapted to different requirements.

Because of the vast amount of experience acquired by the manufacturers of infar-red equipment since its introduction for industrial use about twenty years ago, any task requiring a temperature of about 700° F. and below can be supplied with an efficient and dependable heat source in a custom-designed unit. This same experience enables the equipment manufacturers to recommend flexible units that can deliver heat efficiently for a number of tasks. In some cases, such units can be altered by the user himself to suit requirements of a specific process.

Degreasing metals

The process of degreasing, or burn-off as it is sometimes called, is a very simple one using infra-red equipment. It is done for a period of 5 to 8 minutes at a temperature of 650° F. to 675° F. The removal of surface oils and grease from lap joints, seams, bends, and recesses must be thorough if a rust-inhibiting surface suitable for adhesion of

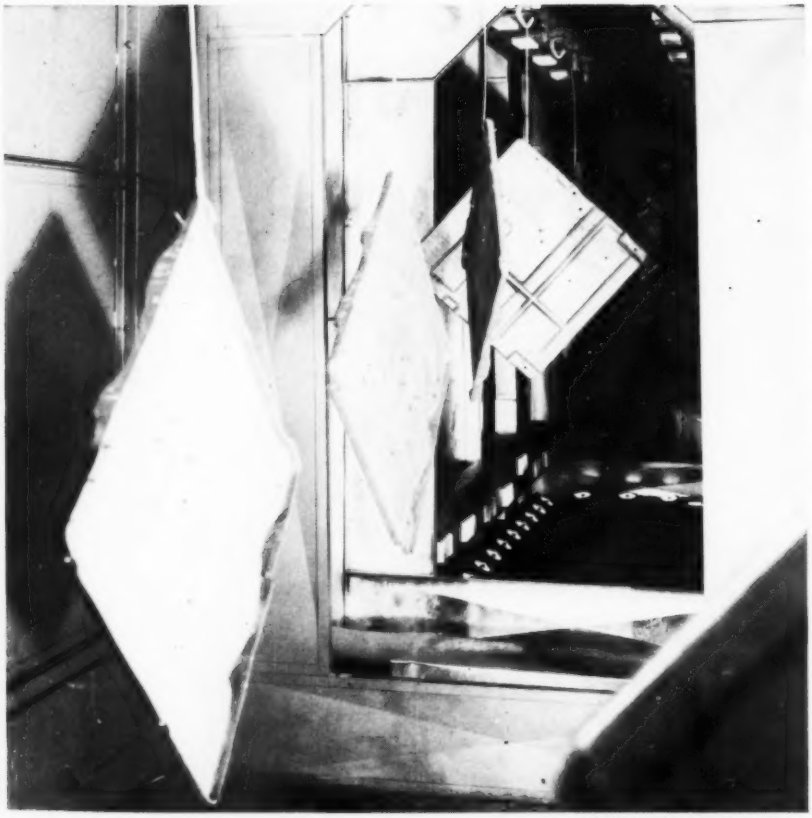


PHOTO COURTESY OF BURDETT MFG. CO.

An infra-red oven used for dry-off of parts that have just come out of the washer at the Teletype Corp. The conveyor speed is six fpm, and the dry-off time is two minutes at 400° F. Infra-red radiation is produced by incandescent gas-fired ceramic burners visible as small round spots at the bottom of the dryer.

paint is to be produced. The time-temperature cycle mentioned earlier raises the metal temperature of the product above the volatilization temperature of the surface oils and impurities, resulting in a completely-dry surface. If the residue oil trapped in the recesses is not removed, it literally fries out during later baking operations, resulting in a blushing of the painted surface.

Drying after cleaning or phosphatizing operations

Following cleaning of metal parts, rapid drying of the final rinses can be readily accomplished with infra-red equipment. Usually, a finishing process is set up so that metal parts can move rapidly from metal preparation to application of a finish. Since speed is a prime requisite in dry-off, the use of infra-red is logical if the proper type of source is selected.

Application of phosphate compounds to metal parts causes a reaction with the iron, forming a rust-resistant coating of iron phosphate. Infra-red heating helps to form this protective coating, while it evaporates the water from the solution. A well-engineered heating installation can be a very useful part of any dry-off operation.

Drying porcelain enamel

Water is the principle vehicle in porcelain enamel slips that are applied by dipping or spraying. The slip is dried immediately after application, and as rapidly as possible. Infra-red has proved to be very satisfactory for this purpose in an increasing number of plants. As much of the equipment used for the application of porcelain enamel slip is automatic, or nearly so, continuous, rapid drying is considered essential. Infra-red is one of the heat sources available that lends itself to the requirements of drying porcelain enamel slip.

Drying and baking organic metal finishes

One of the most widely used applications of infra-red heating is in the drying or baking of organic finishes. Because of infra-red's effect of heating the base metal, highly-efficient drying or baking can be accomplished. The average industrial finish used for coating fabricated metal products contains some solvent that must be evaporated before the "drying" starts. In the case of lacquers, shellac, and similar solution coatings, the evaporation of the solvent is the only drying required.

Oil base paints dry primarily by oxidation; that is, oxygen from the air must be present to react with the unsaturated components of the oils to convert them into the hard, tough material that forms the ultimate film.

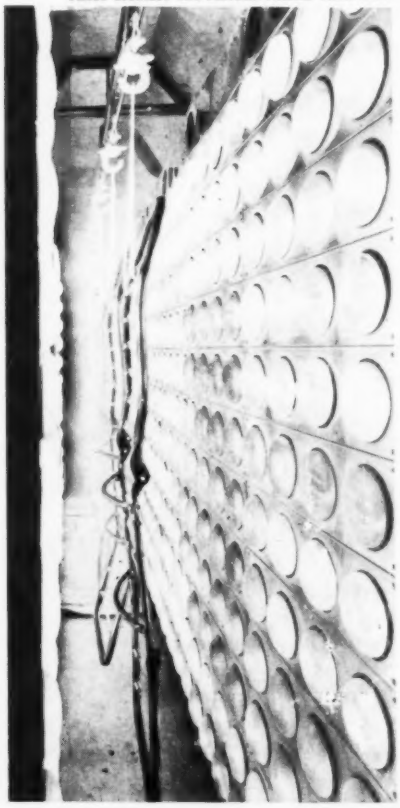
Some organic finishes undergo polymerization while drying. Polymerization is a process that generally accompanies oxidation, and is accelerated by heat from an infra-red source.

Condensers and evaporators

An excellent application of infra-red heating is in the manufacture of refrigeration condensers and evaporators. Removal of moisture from the inside of condenser and evaporator tubes while retaining continuity of assembly line production is a problem. By the use of

The process of degreasing is illustrated here. The tubular frames are passing through a degreasing oven at Barcalo Mfg. Co., Buffalo, N. Y. The entire process is accomplished in two and one-half minutes. Source of infra-red is a tungsten filament enclosed in a reflector bulb.

PHOTO COURTESY THE FOSTORIA PRESSED STEEL CORP.



infra-red heat, the problem of keeping tubes dry while being assembled can be solved.

Pre-heating before painting

Certain types of organic finishing processes make it desirable that the metal parts be pre-heated prior to the application of the paint. One of these processes is wrinkle finishing. In this finishing operation, the parts are pre-heated to 250-300° F. in preparation for application of the wrinkle finish. This pre-heating can be accomplished in a very few minutes when the correct source of infra-red heat is used.

Pre-heating metal prior to fabricating

In some cases, it is the practice to pre-heat metal prior to punching or shearing. Infra-red heating can accomplish this task easily and efficiently. The component heating units that are available from manufacturers of infra-red equipment can readily be adapted to varying widths of sheet, coil, or strip stock. Certain areas of the metal that will not be sheared or punched can be left unheated. This is an important economic advantage of infra-red equipment.

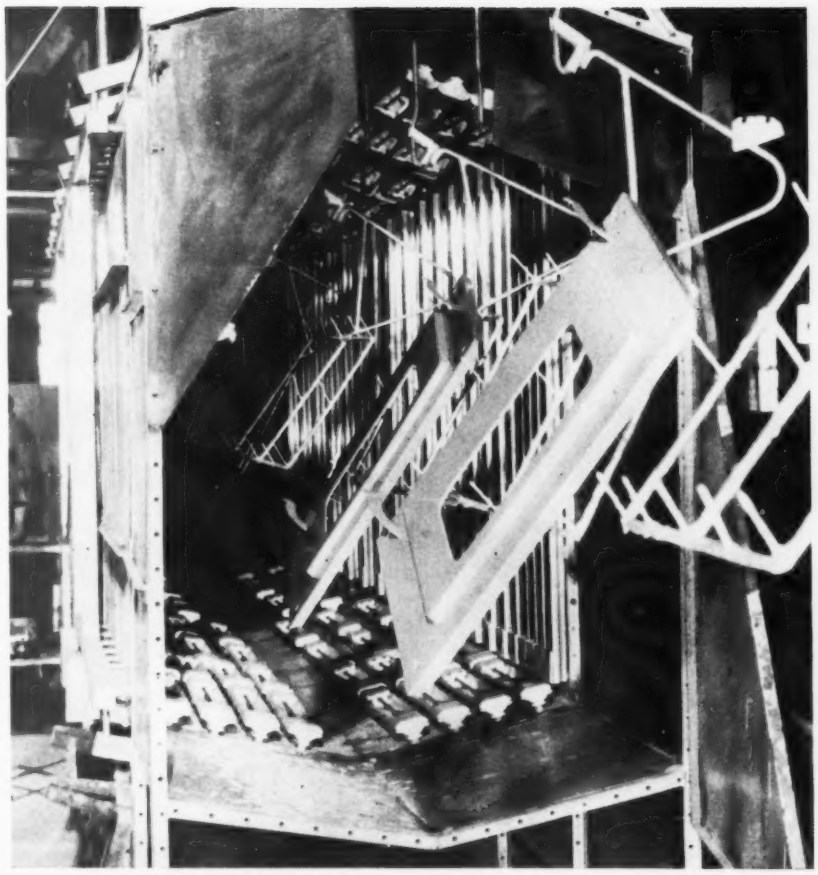


PHOTO COURTESY EDWIN L. WIEGAND CO.

Baking an organic finish on small metal parts with the use of tungsten filament lamps and metal reflectors. Infra-red heating equipment permits straight line conveyorized production.

PHOTO COURTESY WESTINGHOUSE ELECTRIC CORP.

This view illustrates the use of metal rod-type infra-red heaters for the drying of porcelain enamel slip on range parts. These parts are of 20-gauge steel, with an area of about five square feet of porcelain enamel on both sides. The operating temperature in the oven is 400° F.

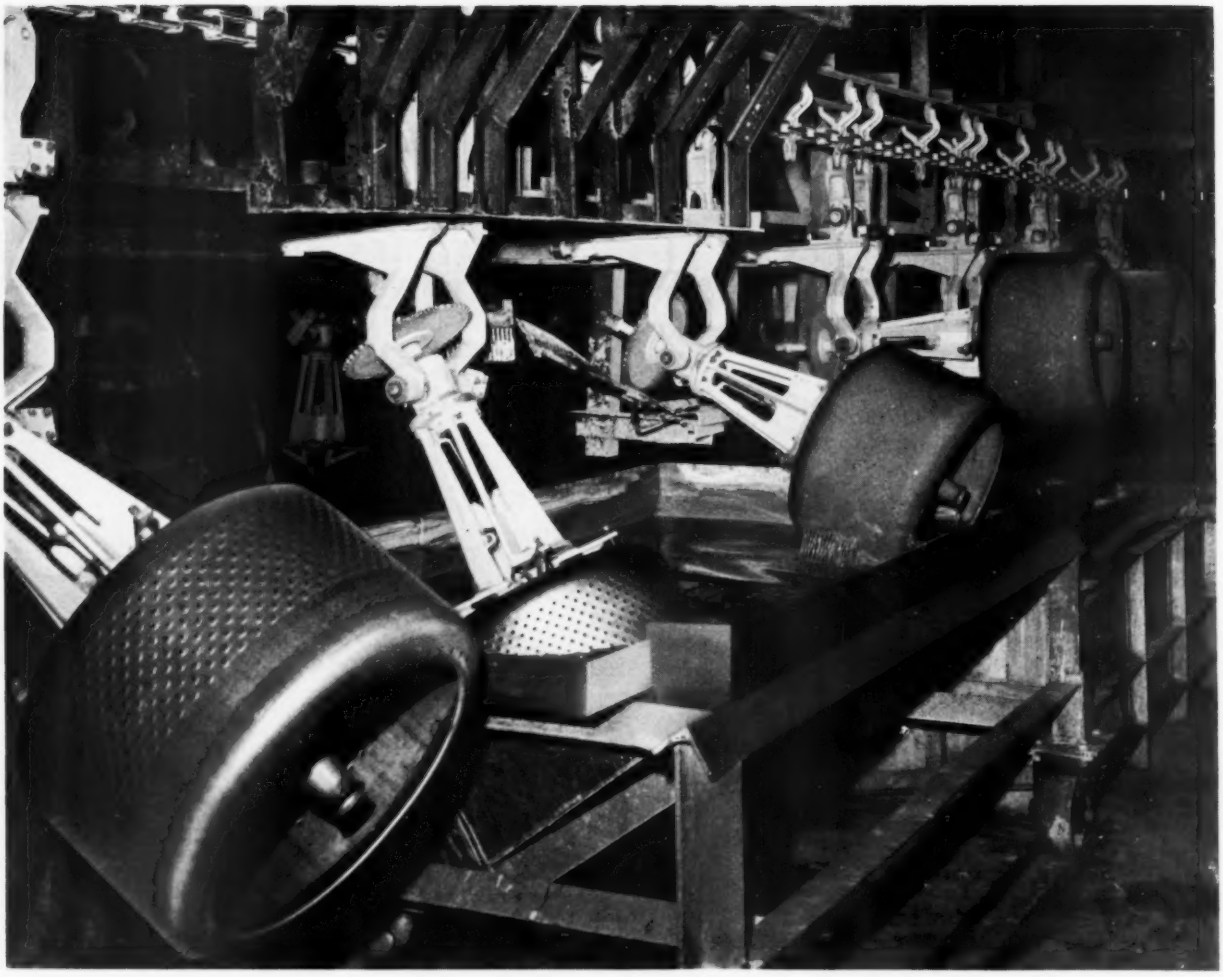
Another application of infra-red heating to the process of fabrication is in heating metal prior to welding. The speed of welding is increased in certain operations when using unusual metals or varying thicknesses of metals. Again, because of the fact that portable infra-red equipment is so flexible in the manner in which it can be adapted to different sizes of parts, selected areas of the metal may be heated without raising the temperature of surrounding areas appreciably.

Infra-red heating can be used effectively to cure plastic dies used for non-ferrous metal fabrication. There is increasing use of plastic dies for short run press work. Portable infra-red units can be used for this task.

Curing adhesives

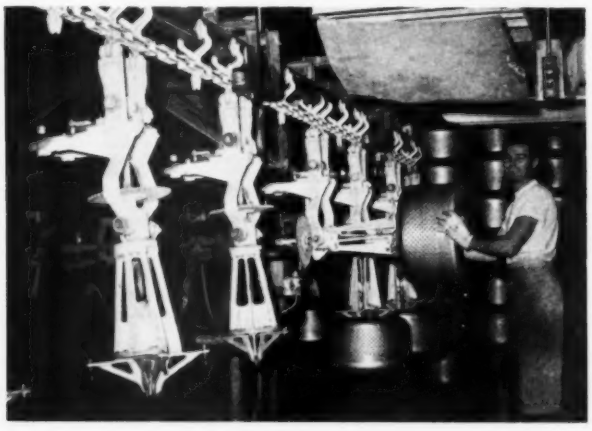
Another application of infra-red heating is for curing adhesives used in bonding metal to insulating mediums

to Page 73 →

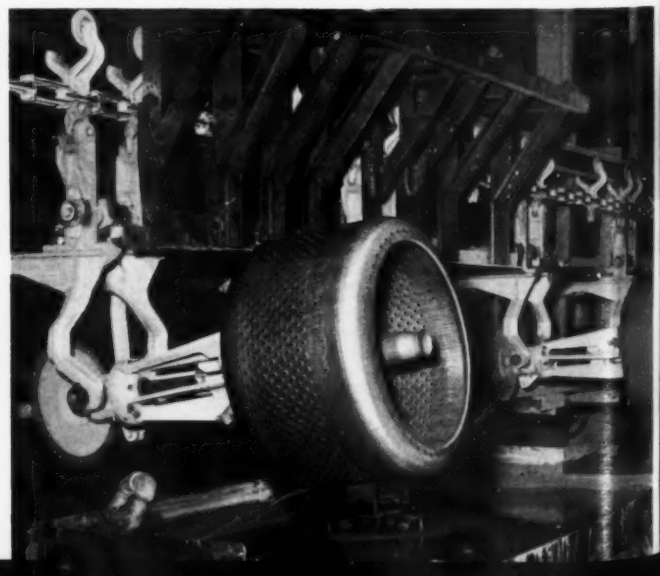


Expanded view of rotating basket about to be immersed in ground coat dipping tank.

Pickled baskets are loaded on the holding tool. Tools are suspended on conveyor, and baskets are held on tools by fingers on inside of tube running through center of basket.



Basket just before the dipping operation, showing the tube by which the basket is held on the tool. This tube is actually the agitator shaft, making it easier to mount on fixture.



Tooling for automatic dipping of spinner baskets at Whirlpool

MPM EXCLUSIVE FEATURE

THE PHOTO sequence shown on these pages traces the main steps in the automatic dipping of washing machine spinner baskets at Whirlpool's Clyde, Ohio plant.

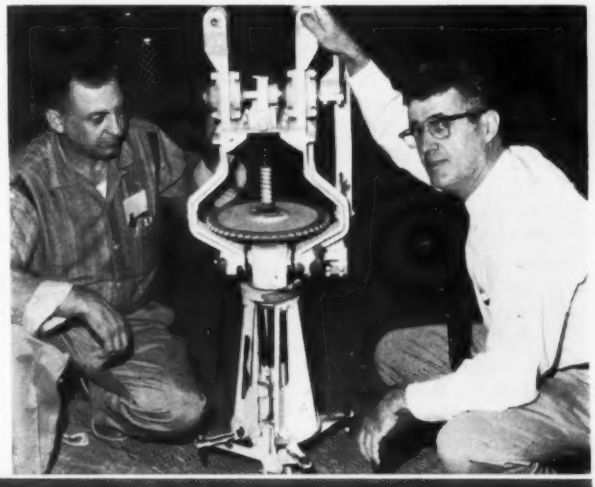
A conventional porcelain enamel ground coat formula, the same as used for hand dipping, is used in coating spinner baskets.

As can be seen in the photographs, the baskets are rotated by means of a spur gear connected to that portion of the dipping tool which holds the basket. The baskets are held on the tool by means of fingers on the inside of the center of the tube that runs up through the center of the spinner basket.

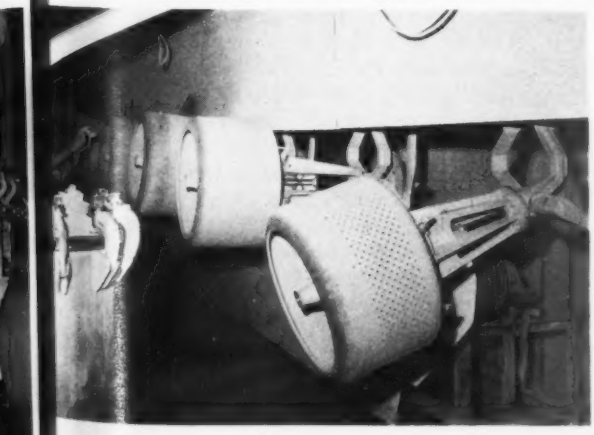
The unit was developed by Whirlpool engineers, and represents an important step in mechanization of what was formerly an awkward, but necessary, hand operation.

The spur gear on the tool rolls on a rack positioned at various angles, depending on the dipping action required. The rotation speed of the tool, for dipping and subsequent draining, is governed by the speed of the conveyor. Rotation speed in the reinforcing booth is controlled independently of the conveyor speed by means of a chain which can be varied in speed to suit production requirements.

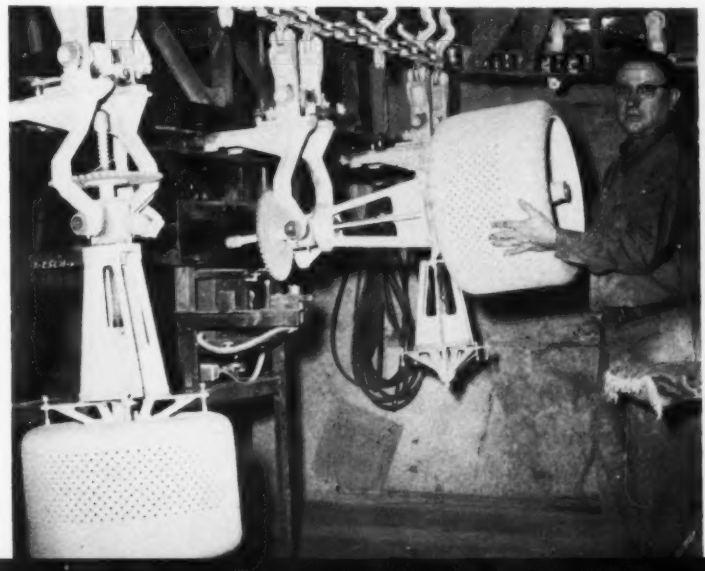
Ralph Gray and Lew Farrow display one of the fixtures. Entire unit, developed by these men with the cooperation of the tooling department, was designed and installed by company personnel.



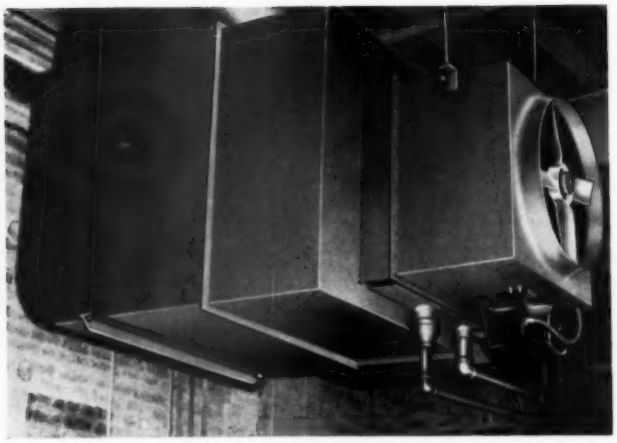
Operator reinforces baskets as they are mechanically revolved by means of chain behind basket. Interior of part is also stippled in this booth.



Furnace transfer area, with operator removing basket from unit. Baskets are removed by means of a magnetic switch which releases the holding fingers. The part is then transferred to the furnace chain in rear.



Industrial Developments



Air make-up unit may be used as unit heater, or as a source of filtered air for ventilation. Other accessories make it adaptable to either wall or roof installation.

Air make-up unit

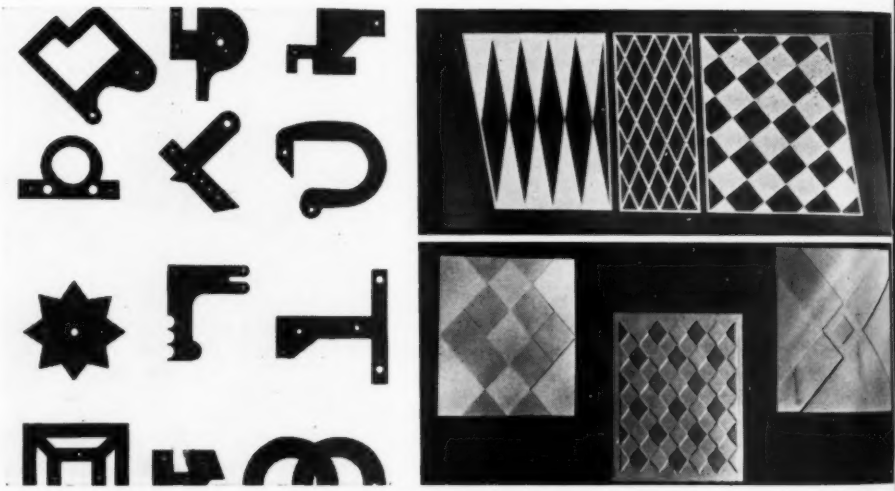
DESIGNED to temper outside air, and supply it in sufficient quantities to eliminate negative pressures, this air makeup unit supplements the normal heating system by relieving the infiltration heat load. The unit replaces exhausted air with clean, fresh, pre-heated air.

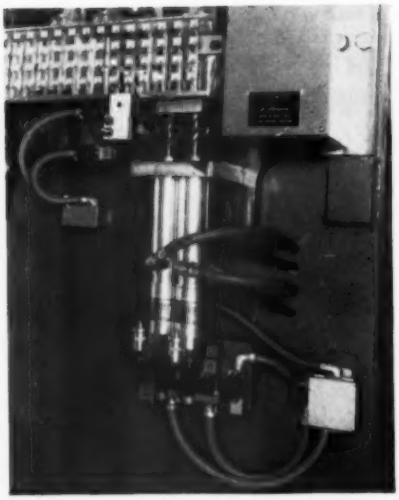
For further information, contact Dept. MPM, Aerovent Fan Co., Inc., Piqua 25, Ohio, or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Chemical milling

THE new chemical milling process is just beginning to find its way into the appliance field. A technique wherein thousands of parts can be milled simultaneously, the process can be used on intricate parts too complicated for stamping (left). Attractive decorative finishes are also produced by chemically milling a finished part. Very light cuts give a textured appearance (top right), while deeper cuts give a three-dimensional effect (lower right).

For further information, contact Dept. MPM, United States Chemical Milling Corp., 1700 Rosecrans Ave., Manhattan Beach, Calif., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.





Machine drills and countersinks six holes in right and left hand die cast grilles at cost-cutting, high-production rate. Automatic indexing selection is controlled by panel of 18 relays working with 12 signalling limit switches. Automatic switch sets up circuitry for automatic operation.

Automatic drilling speeds production

NEW machines have been designed and built which drill and countersink six holes in right and left hand die cast grilles at cost-cutting, high-production rates. Automatic index selection is controlled by a panel of 18 relays working with 12 signalling limit switches. The push-button control panel includes start and stop, and three-position Off-Manual-Automatic switches. Separate push-button switches individually operate each drill unit, index the slide, or actuate the clamp members for machine alignment or adjustments. The "automatic" switch sets up the circuitry for automatic operation. Working components can be adjusted to perform the work cycle in approximately four seconds to practical precision tolerances. Electric and pneumatic circuitry controls and related components adhere to J. I. C. standards.

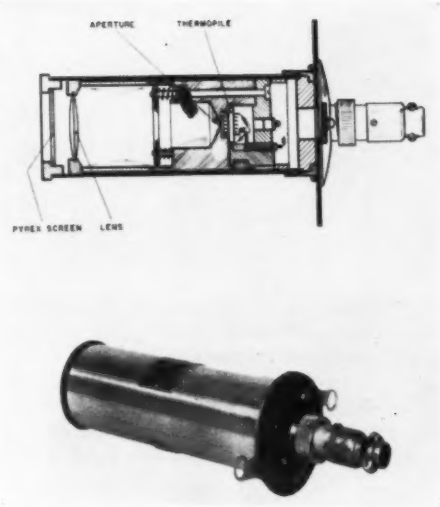
For further information, contact Dept. MPM, J. C, Thompson Tool & Die, Inc., 3000 Engle Rd., Fort Wayne, Ind., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

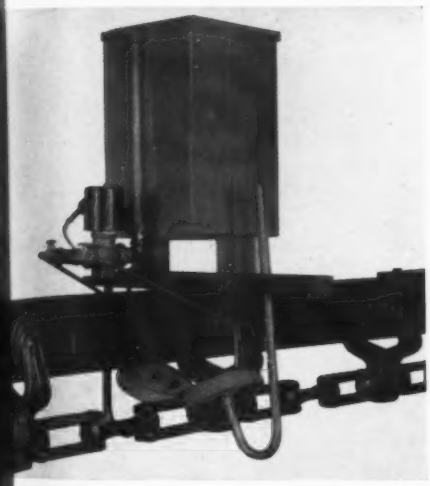
High temperature pyrometer

A high temperature measuring instrument, recently introduced, is said to accurately measure the temperature of hot objects without touching them. The instrument, called the Land Radiation Pyrometer, measures the radiant energy given off by hot objects and is particularly useful in measuring the temperature of objects beyond the normal range of thermocouples, moving objects, and where corrosion or other conditions eliminate the use of conventional resistance temperature detectors. It is expected wide application will be found in high temperature furnaces and kilns. Several models are available for ranges between 1000 and 3300° F. All instruments are sealed against dust and fumes. Protective air purge fittings are available.

For further information, contact Dept. MPM, Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. Fourth St., Philadelphia 33, Pa., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Unit measures radiant energy given off by hot objects. Particularly useful in measuring temperature of objects beyond the normal range of thermocouples, moving objects, and where conditions eliminate use of conventional resistance temperature detectors, it is expected the pyrometer will find wide use in high temperature furnaces and kilns.





Automatic oiler applies even film of oil by direct contact of oil-carrying felt rollers. There is no mist, spray, or drip. Link bearings and pins are oiled each time they pass device. Oil flow is by gravity.

Automatic conveyor oiler

An automatic oiler for conveyor chain links and pins applies an even film of oil by direct contact of oil-carrying felt rollers. There is no mist, spray, or drip, it is stated. The unit can be used with all chain-type conveyors, but is especially advantageous for those conveyors where oil drip is objectionable. Rollers apply an oil film to each side of the chain simultaneously. They are independently hinged so that equal roll pressure is constantly maintained despite normal swaying of the conveyor chain in motion. Roller contact with the chain is effected manually by means of a lever. A solenoid valve automatically starts and stops oil flow as the conveyor starts and stops. Two needle valves directly control the oil flow to each side of chain.

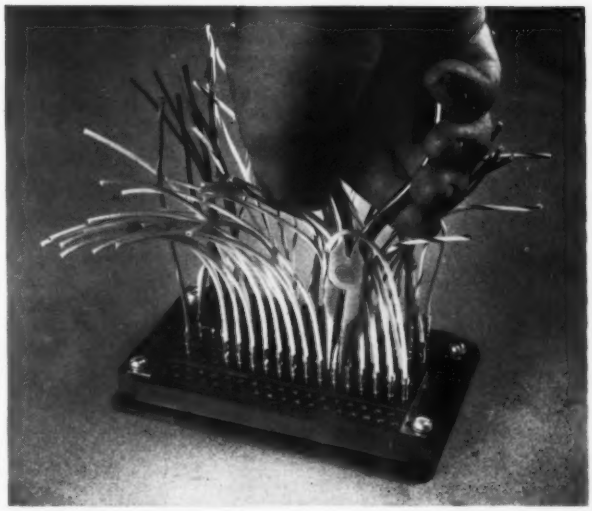
For further information, contact Dept. MPM, Olsen Mfg. Co., 638 S. Rochester Rd., Clawson, Mich., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Taper-pin connectors

A compact, versatile taper-pin panel assembly has been recently introduced which takes the new Stapin solderless taper pins. The panel assembly is said to incorporate a high degree of flexibility in connections. This feature is expected to make the panel assembly especially valuable in circuit testing and development. Versatility is achieved with an aluminum frame in which shielded panels are snapped and locked. While a frame will accommodate as many as five or eight panels, no more need be used than necessary .

For further information, contact Dept. MPM, Burndy Corp., Norwalk, Conn., or Special Projects Editor, METAL PRODUCTS MANUFACTURING.

Panel offers circuit connection flexibility. Cables terminated with taper pins are tool-inserted into panels, of which up to five or eight may be inserted in the frame. Types of panels may be selected for specific requirements. Needle-nose pliers remove Stapins from sockets for circuit changes.



Make Your Next Finishing System a BURDETT!

This One Is Producing 4000 lbs. Per Hour With a Conveyor Speed of 8 fpm.

Here is one more sparkling example of well above average output, at much below normal costs, with excellent match of color and hardness of finish.

Located in the Mayville, Wisconsin plant of Maysteel Products, Inc., this complete Burdett Finishing System consists of a 3-stage washer, a single pass dry-off oven—a 2-pass prime oven—and a 2-pass finish oven.

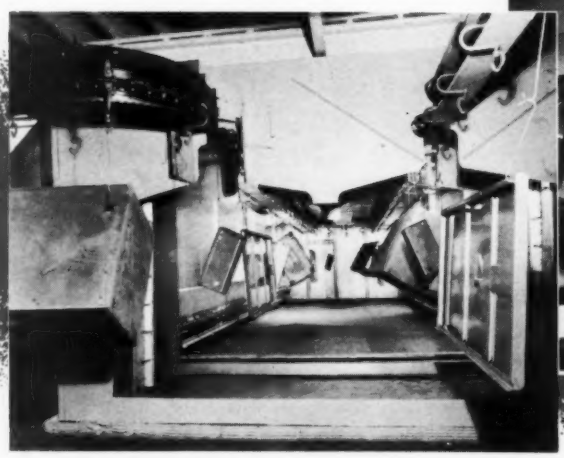
The 3-stage washer features a stainless steel immersion heating system which provides solution temperature rise of 5° per minute.

Production of this plant is largely on a job basis, including heavy transformer tanks, requiring a very hard finish—heavy lathe benches finished with a wrinkle finish—and varied metal enclosures and products.

Fuel is propane gas.
Conveyor speed—8 FPM.
Cost of $6.50 per hour is average over a six month period, for the entire system.

Unusual Results? That they are, yet results that can be expected from every Burdett installation—and most important to you in meeting today's razor-edge competition.

Whether you are considering a completely new finishing system—an addition to your present layout—or the renovating of your old system—consult Burdett for the engineering answer with the bonus values—either "Radiant" or "Convection"



SEE OUR CATALOG IN SWEET'S PLANT ENGINEERING FILE OR WRITE FOR COPY

Request complete information without delay!

Write for the Burdett story!

BURDETT
MANUFACTURING COMPANY

4918 South Monitor Avenue, Chicago 38, Illinois

DETROIT PHILADELPHIA NEW YORK CLEVELAND DALLAS

Manufacturers of
COMPLETE FINISHING SYSTEMS — "RADIANT-HEAT" SYSTEMS, OVENS, HEATERS, AIR MAKE-UP UNITS, SPRAY BOOTHS AND WASHERS

NEW

SUPPLIES & EQUIPMENT

Open Gap Horn Press

A 500-ton open gap horn press for coining has been introduced. Specifications of the press are: 8″ throat depth; 19½″ daylight; 6″ stroke; and a moving slide area of 14″ x 14″. Of welded steel construction, fully stress-relieved prior to machining, the press is equipped with a closed-circuit Fastraverse system of operation with manual and automatic press control.

For further information, contact Dept. MPM, The Hydraulic Press Mfg. Co., a division of Koehring Co., Mount Gilead, Ohio.

Continuous, Self Cleaning Filter

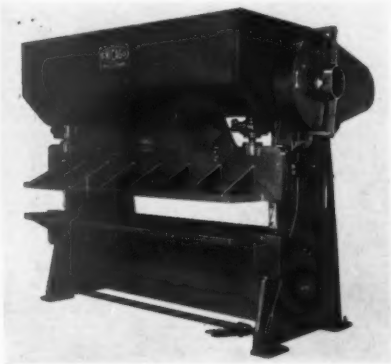
Greater filter surface area is provided through the use of a leaf-type design filter element in the Dual Manifold Filter, it has been announced. The leaf-type filter element is said to offer a distinct advantage in the increased area, and because of the flexibility of the filter media. The filter may vary through the whole range of natural, synthetic, and metallic fibers, depending on service requirements.

For further information, contact Dept. CF-317, Industrial Filtration Co., Lebanon, Ind.

Modified Design Press Brake Gives Large Die Area

A modified design of a light-duty press brake as a standard machine for producing light stampings has been introduced. The machine is provided with wide bed and ram giving a die area of 36″ x 77″, has a stroke of 3″, a speed of 40 strokes per minute, and is driven by a 3 hp. motor, the manufacturer states.

For further information, contact Dept. MPM, Dreis & Krump Mfg. Co., 7400 S. Loomis Blvd., Chicago 36, Ill.



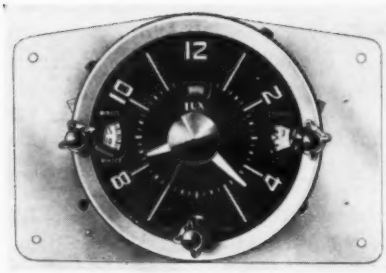
Aluminum Etchant

After two years of research and development work, a new aluminum etchant, specifically designed to insure a consistently-uniform etch pattern and etch rate without scale build-up on tanks and coils, has been introduced. It is claimed that these advantages are independent of the aluminum concentration in the bath. Another feature of the etchant is that the type of etch and rate of etch will not vary when etchant is used in industrial waters of various hardness.

For further information, contact Dept. MPM, American Chemical Paint Co., Ambler, Pa.

Fully-Automatic Range Timer

A combination fully-automatic range timer and one-hour electric minute-minder in the 5800 series, approved by U. L. and C. S. A., has been offered. An exclusive feature is the bell chime reminder signal; also one knob "cook now" timing and separate minute-minder topside control. Standard specifications include: 30 amp. switch rating — single pole, double throw—double pole, single throw; dial in blue-gray and silver; set knobs in black; 110 volt, 60 cycle. Precise engineering, combined with exclusive design and construction features, insure complete dependability, it is claimed.



For further information, contact Dept. MPM, Lux Clock Mfg. Co., Inc., 95 Johnson St., Waterbury 20, Conn.

Air-Powered Pump Dispenses Paint Thinners and Solvents

An air-powered pump, specifically designed to safely pump paint thinners, solvents, and all similar fluids direct from original drums to point of use, has been announced. The 1:1 ratio pump enables drums of thinners or solvents to be located outside, or in separate, fireproof areas, and the pump may be mounted on the wall inside the building for access and protection, the manufacturer states.

For further information, contact Dept. MPM, Gray Co., Inc., 1094 Sibley St., N. E., Minneapolis 13, Minn.

More New Supplies & Equipment on next page

Infra-Red Heating Units

A line of tubular infra-red radiant heaters for use in ambient temperatures up to 1000° F. is now available. The units can be used for baking, drying, curing, dehydration, degreasing, preheating, vulcanizing, and other industrial applications requiring controlled, economical heat, it is stated. Called "Vicoray," the line is available in both panels and individual tubular elements completely wired and ready to be erected and connected for use. The units come in both 120 and 240 volt, but can be wired in series for use with 480 volts if desired.

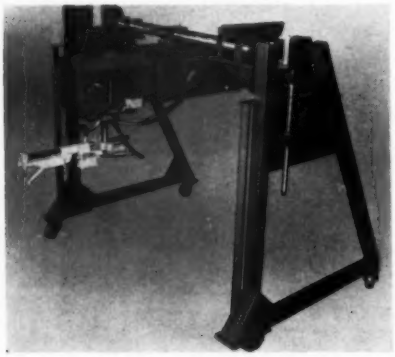
For further information, contact Dept. MPM, Douglas C. Whitaker Co., Inc., 141 E. Glenside Ave., Glenside, Pa.

Friction Saw Blade

A friction saw blade has been field-tested on hundreds of ferrous metals ranging from castings to stainless steel plates and, it is claimed, will cut faster, easier, and will last up to 3 times longer than similar blades. The blade features a more efficient tooth-and-gullet design, and the use of a special heat treating process that permanently anchors the teeth to the band and preserves the set. Metallurgical characteristics permit maximum flexation to the band, resulting in longer life and greater resistance to abrasion at high friction sawing velocities.

For further information, contact Dept. MPM, The DoALL Co., Des Plaines, Ill.

Horizontal Press Extractor



A horizontal press extractor has been developed, and is known as the 6000 Series Horizontal Iron Hand. Its overall length is only 18 inches more than the length of the stroke. Models range in stroke length from 36 inches, with speeds up to 40 strokes per minute.

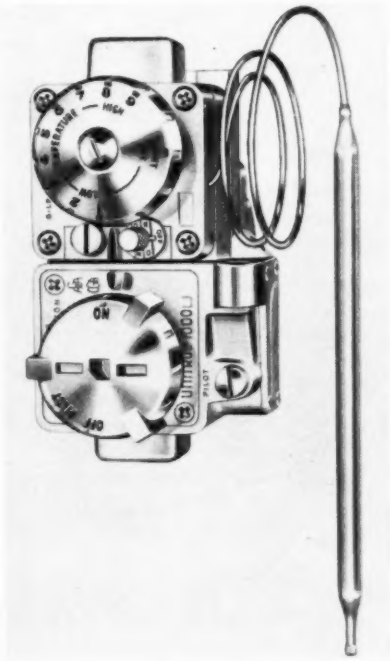
An entirely new feature is the use of a geared non-slip belt in place of roller chains or rack and pinions. The belt needs no lubrication, and has run over a million strokes without stretching, the manufacturer states.

For further information, contact Dept. MPM, Sahlin Engineering Co., Inc., P. O. Box 289, Birmingham, Mich.

New Heating Control

A new combination control for space heating has been introduced. Designated the Unitrol 1000, it combines A and B gas cocks, 100 per cent safe-lighting automatic pilot, pilot filter, pilot flow adjuster, thermostatic gas valve, and pressure regulator in one small, compact basic unit.

For more information, contact Dept. MPM, Grayson Controls Div., Robertshaw-Fulton Controls Co., Long Beach, Calif.

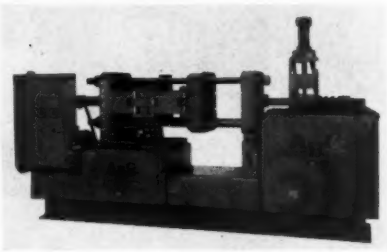


Dual-Function Speed Nut

Development of a speed nut which performs a dual function in refrigerator-freezer compartments has been announced recently. Engineered for this specific application, the spring steel fastener retains the door hinge to the freezer compartment, and provides the necessary spacing for the plastic breaker frame to which the hinge is mounted. Employing this new application, the manufacturer has eliminated two special tapped brackets of heavy cold-rolled steel. Additional material savings have been achieved through the replacement of stainless steel machine screws by less costly plated sheet metal screws.

For further information, contact Dept. MPM, Tinnerman Products, Inc., Cleveland, Ohio.

Die Casting Machine



A Model 5000 hydraulic zinc heavy-duty die casting machine, incorporating many features according to the builders, has been announced. The machine has a capacity of 7 lbs. shot in zinc, 150-ton locking pressure, 2½ inch tie bars, 24″ x 24″ steel platens, extra-large capacity melting furnace, manifold-mounted valves, high cycling speed, and is convertible to aluminum with a cold chamber attachment, the manufacturer states.

For further information, contact Dept. MPM, A B C Die Casting Machine Co., 400 East 142nd St., Dolton, Ill.

Polishing Belt Features Felt Ribs

A new departure in polishing belts has been achieved through the use of diagonal felt ribs incorporated into the design. The ribs present a ridged surface to the work that, it is claimed, results in an effective polishing action. As the ribs wear, a fresh nap projection is being formed, giving a continuous polishing surface. The belt is said to run cooler due to the areas between the ribs not being in contact with the work.

For further information, contact Dept. MPM, The Shaw Belting Co., 150 William St., Middletown, Conn.

Fast-to-apply Pre-cut Self-adhesive Felt

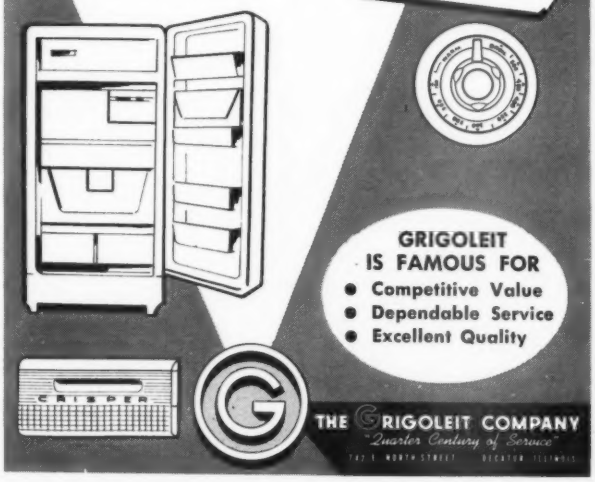
Self-adhesive felt, pre-cut in a wide variety of shapes and sizes, is now available. Mounted on special fast-to-dispense cards or liners, the product, called "Quik-Felt," can be used for sealing, cushioning, spacing, insulating, and protecting parts in maintenance and production work.

For further information, contact Dept. MPM, W. H. Brady Co., 727 W. Glendale Ave., Milwaukee 9, Wis.

YOUR BEST BET
IN TRIM HARDWARE
IS GRIGOLEIT

Whether your trim hardware needs are for custom-made or stock tooled products, call on Grigoleit.

Our complete facilities including designing, engineering and production know-how are at your service.



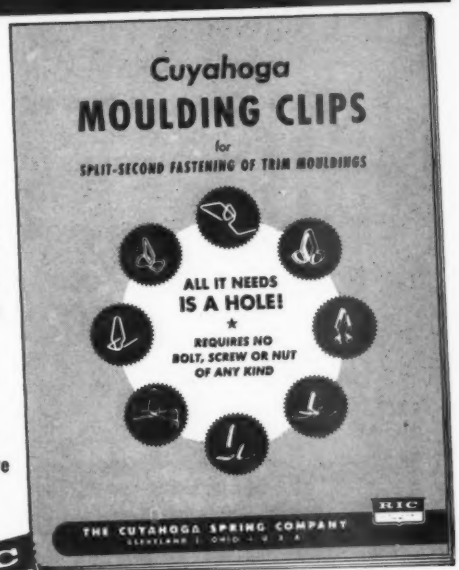
GRIGOLEIT IS FAMOUS FOR
- Competitive Value
- Dependable Service
- Excellent Quality

THE GRIGOLEIT COMPANY
"Quarter Century of Service"

USE MOULDING CLIPS?
You need this valuable book!

IT'S FREE!
- Contains valuable data on standard Moulding Clips.

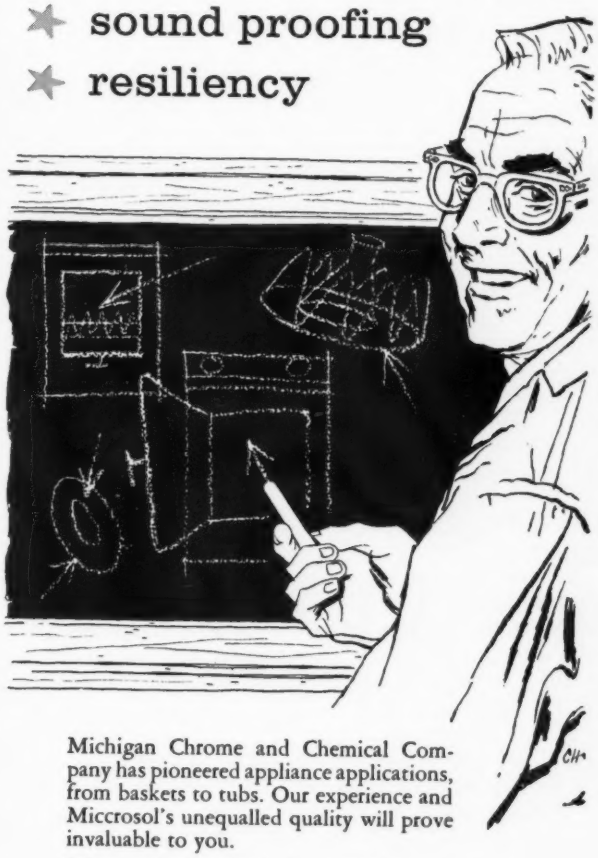
Contact your Cuyahoga representative or write us.



RIC
The CUYAHOGA SPRING Co.
10200 BEREA ROAD • CLEVELAND 2, OHIO

MICCROSOL
the ideal coating for products when you need . . .

- corrosion resistance
- abrasion resistance
- choice of color styling
- sound proofing
- resiliency



Michigan Chrome and Chemical Company has pioneered appliance applications, from baskets to tubs. Our experience and Miccrosol's unequalled quality will prove invaluable to you.

Miccrosol, the plastisol proven by use, is ideal for lining and coating parts and sections of products, where special characteristics are required.

Just send us full particulars regarding your coating and lining problems.

MICCRO Products
MICHIGAN CHROME and Chemical Company
8615 GRINNELL AVE. • DETROIT 13, MICHIGAN

NEW INDUSTRIAL LITERATURE

Illustrated Folder on Aluminized Steel

A new, illustrated, six-page folder tells how aluminized steel resists and reflects heat, and stays strong in elevated temperature service. Some of the points covered are low-cost, high-heat resistance, resistance to combinations of heat and corrosion, heat savings service proved, workability, and how supplied. Copies are available from Dept. MPM, Product Information Service, Armco Steel Corp., Middletown, Ohio.

New Folder on Phosphating Compounds

An iron phosphating compound that cleans and phosphates metals at the same time and a zinc phosphating compound designed to give a heavy coating in tank application are the subjects of two folders recently published. Used in spray washing machines or tanks, the iron phosphating compound converts the surface layer of steel into a hard, dense phosphate coating, weighing from 60 to 90 milligrams per foot, according to the manufacturer. The zinc phosphating compound is designed for tank application and produces a heavy weight coating of 150 to 1200 milligrams per square foot, depending on the time of immersion. For these booklets, write Dept. MPM, Oakite Products, Inc., 26 Rector St., New York 6, N. Y.

Keeping Costs Down When Temperatures Go Up

The above title for a new booklet offers many practical suggestions on extending equipment life where high temperatures are involved, according to the manufacturer. This booklet describes how nickel chromium alloy can withstand 1500-1600° F. without failing. This material is said to retain its strength under sustained high temperatures and resists corrosive attack and scaling by furnace atmospheres. For the booklet, write Dept. MPM, The International Nickel Company, Inc., 67 Wall St., New York 5, N. Y.

Perforated Metal Catalog

A catalog is available which lists many perforated patterns which answer the need for almost any kind of design utilizing perforated metals. The company offering it has thousands of perforating dies, and does not charge for tooling. Practically any material that can be obtained in coils, sheets, or plates up to one inch in thickness can be perforated. Contact Dept. MPM, The Harrington & King Perforating Co., Inc., 5640 Fillmore St., Chicago 44, Ill.

Free New Bulletin and Solenoid Selector

A complete booklet describing the many applications of solenoids is available, along with a solenoid selector that quickly and easily matches a solenoid to a specific application. Applications include valve actuation, clutch operation, switch function, metering devices, shutter and damper control, and many other operations. For the free bulletin and solenoid selector, contact Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

Electrostatic Spray Painting

It can be proven that many cost saving benefits can be had if present production facilities justify conveyorized painting, according to a manufacturer of the electrocoating process. Up to fifty per cent less paint is said to be used by this system. A brochure is available which pictures many on-the-line examples of electro-coating on a wide variety of products, and describes a free survey service. Write Dept. MPM, Ransburg Electro-Coating Corp., Indianapolis 7, Indiana.

Operate Processing Ovens at 800°

An automobile radiator manufacturer recently installed two parallel ovens that normally operate at 800° for the express purpose of soldering radiator tubes and center cores. Each oven has six heating zones — controls, temperature recorders, safety devices and automatic emergency cut-offs are contained in one control panel. Emergency temperatures up to 1000° F. are obtainable with these ovens. For more information, write Dept. MPM for catalog A-658, The R. C. Mahon Co., Detroit 34, Mich.

Zinc Coated Steel Booklet

A continuous process zinc coating on steel is available, which is said to thrive on the toughest fabrications steps — spinning, deep drawing, roll forming and extrusion. Prolonged die life is said to be an advantage because of the lubricative quality of the steel's zinc coating. Send for the new booklet from Weirton Steel Co., Dept. R-7, Weirton, W. Va.

Corrugating Sheets With Roll Forming Machine

It is now said to be possible to corrugate 20 through 28 gauge galvanized steel, aluminized steel, plain and embossed aluminum. A new roll forming machine available requires only vertical adjustment for gauge range. Roller die tooling is available for ½″ or ⅞″ depth. The operating speed of the machine is 150′ per minute, and it is claimed that an excellent control of coverage and depth is possible. For complete information, contact Metal Products Manufacturing, York St. at Park Ave., Elmhurst, Ill.

Save Production Steps With Pre-plated Chrome Steel

One manufacturer using pre-plated chrome steel at one time did its own cleaning, plating and buffing. After switching to the use of pre-plated chrome steel, the only methods required for fabricating are stamping and forming. Free literature is available which describes many applications of pre-plated chrome steel. Write Dept. MPM, American Nickeloid Co., Peru 11, Ill.

Metal Cleaner — Phosphate Coating Information

Complete information is available on a wide range of metal cleaners, phosphate coatings and cold working lubricants. An aluminum etching problem was solved, according to the manufacturer, with the use of this company's etching compound. Lower operating temperatures are said to be possible, and sludging and scale formation were said to be reduced. For more complete information, write Pennsalt Chemicals, Dept. 567, 3 Penn Center, Philadelphia 2, Pa.

Some Good Things to Know About Metal Cleaning

The above headline is the title of a new booklet that answers such problems as: what kind of cleaner attracts both oil and water; how does this help remove buffing compound residues and pigmented drawing compounds; what

FROM THE BEAUTY ANGLE—

Nothing better can be said of your product:

"It has a PORCELAIN ENAMEL Pemco Covercoat"

Customers find it difficult to resist the charms of a product that has the eye appeal of a Covercoat by Pemco. In clean, sparkling white or a wide range of colors, a Pemco Covercoat *means* beauty.

And . . . it's beauty that will not fade with time. Durable, easy-to-clean Porcelain Enamel provides resistance to acid, alkali, heat and abrasion.

No matter what the beauty or production requirements of your product, Pemco frits are adaptable. They help you lower reject percentages and simplify application procedures. Matching characteristics are excellent. Pemco brings you these and other advantages that give you a quality finish . . . always uniform, always beautiful.

Your Pemco representative will be happy to acquaint you with the many advantages of Pemco Products and Pemco service.

Manufacturers of "the World's Finest"
Porcelain Enamel Frits, Glaze Frits, Coloring Oxides, Screening Pastes, Body and Glaze Stains, Underglaze and Overglaze Colors, Vitrifiable Glass Colors.

WORLD'S FINEST PEMCO CORPORATION
BALTIMORE 24, MARYLAND

NEW INDUSTRIAL LITERATURE → *from Page 62*

are the advantages of reverse current for electro-cleaning steel; and can you clean steel and condition it for painting for less than twenty cents per thousand square feet? For the free, 44-page illustrated booklet, write Dept. MPM, Oakite Products, Inc., 26 Rector St., New York 6, N. Y.

Decals for Heat, Abrasion, and Weathering

New, improved decals are said to be resistant to heat, abrasion, weather and other adverse conditions. According to the manufacturer, depending upon the surface and conditions of use, one of these new type decals will almost certainly solve one's problem. Complete new data is available on these decal nameplate markings. Write Dept. R-321, The Meyercord Co., 5323 W. Lake St., Chicago 44, Ill.

Plan Book of Metal Mouldings

Rings for washers, bezels for television, dinette trim and aprons, refrigerator kick plates and escutcheons, stove back guard trim, sink rims, medicine cabinet frames, wallboard mouldings are some of the applications for stainless steel or other metal mouldings. Facilities for rolling, bending, stamping and buffing are described in this book whose title is the head of this item. Write Dept. MPM, Pyramid Mouldings, Inc., 5365 W. Armstrong Ave., Chicago 30, Ill.

Illustrated Catalog on Packaging Containers

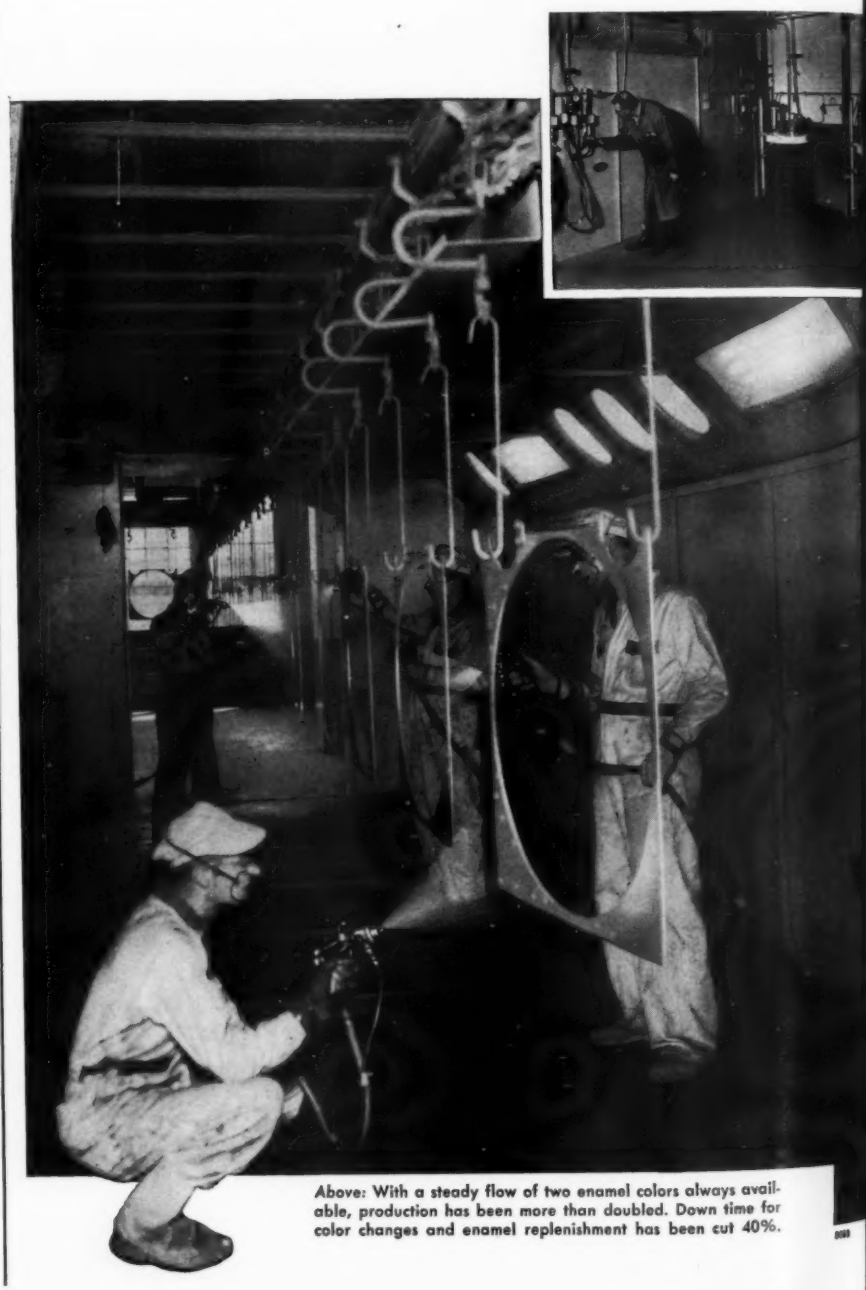
A free, illustrated catalog, describing many different kinds of containers is available. Such containers as pallet boxes —wirebound, or with hinged corners— cleated boxes, cleated and corrugated boxes, wirebound crates, wirebound boxes, corrugated boxes, and hinged corner crates or boxes are described in this complete booklet. Write Dept. MPM, Chicago Mill and Lumber Company, 33 S. Clark St., Chicago 3, Ill.

Silicone Resin to Improve Organic Finishes

A new silicone resin that is especially designed for cold-blending with alkyd, melamine, and acrylic type baking enamels is now available. The new material is said to give these finishes improved color and gloss retention, thermal stability, and resistance to weathering. The manufacturer expects this material to find wide use as a base for aluminum paints to operate in the 500-1200° F. range. Some applications already developed include external coatings for ovens, space heaters, furnaces and exhaust systems. This resin is also used in enamels for transformers and motors, high temperature lamps, radio tubes and electrical components and appliances. Write for data from Dept. MPM, Silicones Division, Union Carbide Corp., 30 E. 42nd St., New York 17, N. Y.

Foam Plastic Components Catalog

A complete new catalog showing many of the custom low temperature insulation, buoyancy and packaging products molded of polystyrene foam plastic is available. Photographs and descriptions of many applications for which these foam plastic products have been used are included in this folder. Because of the fact that these foam plastic parts are vermin and insect proof, mold proof, impervious to odor absorption, and extremely adaptable for use in all types of refrigeration; they have innumerable applications far exceeding even those illustrated, according to the manufacturer. For the free booklet, write



Above: With a steady flow of two enamel colors always available, production has been more than doubled. Down time for color changes and enamel replenishment has been cut 40%.

Dept. MPM, Glo-Brite Products, Inc., 6415 N. California Ave., Chicago 45, Ill.

Catalogs on Pumps and Spray Units for Painting

Two well-illustrated catalogs are available, one describing a line of reciprocating pumps and the other on lubricating equipment and complete spray units for painting are available. The reciprocating catalog describes how these air powered units can be used for paint and circulating systems, heavy viscous transfer, extruding and spraying. Catalog is completely indexed to quickly give information on painting, job planning and other information. The spray unit catalog is also well-indexed and illustrated. Practically every operation utilizing this type of equipment is completely described. Write Dept. MPM for catalogs No. 453 or 403, Gray Co., Inc., Graco Square, Minneapolis 13, Minn.

Valves, Driers and Accessories for Refrigeration Applications

Complete booklets are available describing the following equipment for use in refrigeration, air-conditioning and industrial applications: strainers and filters, driers, and valves. Each is completely described, and charts are available which give complete data on each particular type of part. These three booklets are obtainable from Dept. MPM, Henry Valve Co., 3215 North Ave., Melrose Park, Ill.

Film Shows Manufacture and Use of New Super Alloy Steels

How the lighter, new super alloy steels and reactive metals are made and used is the subject of a film, "Steel Valley," released jointly by the Industrial Information Institute of Youngstown, Ohio and Sharon Steel Corporation. Narration is by the well-known commentator, Frank Blair. The rapid strides made in the development of special steels, including stainless steel, is a feature of this new release which also includes shots of the melting and processing of steel in Sharon's Pennsylvania and Ohio plants. Running 18 minutes, "Steel Valley" is available for showing without charge to factory employee groups, professional societies, service clubs, colleges and schools. Requests for showing should be directed to Arthur Schmidt and Associates, Dept. MPM, 342 Madison Avenue, New York 17, N. Y., or Public Relations Dept., Sharon Steel Corporation, Sharon, Pennsylvania.

Cost Reduction Booklet on Fastenings

A booklet entitled "A critical re-examination of the price-per-thousand purchase policy" is available for management, engineering, and purchasing people, and covers how a fastener manufacturer has devoted a great deal of time and effort to reducing costs through pre-assembly and quality improvement in the field of fastenings. The booklet gives complete information on how this can be done, in the eyes of this company. Old fasteners and costs per thousand are compared with typical engineered fastener costs per thousand in very interesting case history studies. Other information is included which is extremely valuable to fastener users. Write Dept. MPM, Shakeproof Div. of Illinois Tool Works, St. Charles Road, Elgin, Ill.

Stainless Steels Brochure

A booklet is available which completely describes all of the uses for stainless steel. Fasteners, automotive parts, appliances, housewares, and industrial use products are completely described in this booklet. Write Dept. MPM, Sharon Steel Corp., Sharon, Pa.

Far left: Binks air-operated pumps send enamel direct from 55-gallon drums to adjacent spray booth. Binks DUALHEET paint heaters, being inspected, raise enamel to 140° F. This lowers viscosity and reduces need for thinners.

Left: Metal assemblies start 3-stage phosphatizing operation in the Mayville, Wisconsin, plant.

AT MAYSTEEL, BINKS SPRAY UNITS HELP

boost phosphatizing, priming and painting production by 200%

"Maysteel Products, Inc., produces sheet metal parts and finished products on contract. As part of our expansion program we needed a modern finishing system that would produce quality work on tight schedules. To help us solve the problem, we called in Binks," reports Maysteel's president, Mr. C. E. Stryker.

Complete finishing system

METAL PREPARATION: A three-stage conveyorized phosphatizing system was developed employing 384 Binks stainless steel spray nozzles. The nozzles completely bathe the metal parts in chemically treated water, wash water and chromic acid rinses. Materials are reclaimed and recycled.

METAL PRIMING: Continuing on the conveyor, parts pass through a drying oven into a 22′ water wash spray booth. A Binks circulating system supplies primer to two painters using Binks Model 7 spray guns.

ENAMELING: After another oven drying, the parts are ready for a coat of hot spray enamel in a second water wash spray booth. Up to five painters using Binks Model 7 spray guns are supplied by a two-color circulating system. Binks Dualheet paint heaters, located just outside the booth, raise the enamel to 140° F. This eliminates the need for thinners and insures full-coat coverage in a single pass.

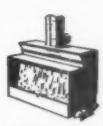
Engineering assistance available

Learn how Binks extensive finishing experience and equipment can be of benefit to you. There is no obligation. Just contact your nearest Binks Branch Office or, if you prefer, write direct to the address below.

Ask about our spray painting school
Open to all... NO TUITION... covers all phases

Binks
EVERYTHING FOR
SPRAY PAINTING

SPRAY GUNS


SPRAY BOOTHS

NATIONWIDE SERVICE

Binks Manufacturing Company
3122-40 Carroll Ave., Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

RCA Whirlpool Vacuum Cleaners Now in Production

First units of the first line of vacuum cleaners to be marketed under the RCA Whirlpool brand name have come off the production line of Whirlpool Corp., according to Neil Griebenow, vice president and general manager of the St. Paul division. TV personality Fran Allison officially started the production line and autographed what is believed to be the first vacuum cleaner ever produced in the state of Minnesota.

Transfer of manufacturing facilities from Birtman Electric Co. (Chicago) to the St. Paul division has been completed. Tooling for the new model permitted pilot production to begin the day following the shut-down of the Chicago plant.

Easy Introduces New Under-Counter Washer-Dryer

Introduction of a new under-counter model Combomatic washer-dryer, model CDU, scheduled for July delivery, was announced recently by Easy Laundry Appliances. It is the first under-counter machine in the Easy line.

Designed to fit into kitchen, closet, bath, utility, or recreation room, the new washer-dryer is only 27 inches wide. A small combination unit, it requires less than half the space needed for a separate washer and dryer. A reportedly high-styled prestige unit of modern design, the new model incorporates all of the features of Easy's Combomatic washer-dryer, model CDH, introduced last fall. The control panel of the under-counter model is on the front of the machine. Height is 34½ inches, depth 25 inches.

The Easy under-counter combination unit requires no venting. The chip-free, rust-resistant cabinet is white enamel on phosphate coated steel. The tumble tub is porcelain enamel, and the cabinet top is white porcelain enamel finish.

Maytag Has Second Best Year in 1957

Saleswise, the year 1957 was second only to record-breaking 1956 for the Maytag company, according to preliminary figures for the past year released by company officials. The year just ended topped 1955 in both sales and earnings.

Net sales of the Maytag company and domestic subsidiaries during 1957 totaled $98,613,000, a decline of 13 per cent from the $113,015,000 in sales during 1956, a year which set records for both the company and the appliance industry. Sales of $93,067,000 were registered in 1955.

Net earnings for 1957 totaled $6,633,000, compared to earnings of $8,458,000 the previous year, a 22 per cent decline.

Westinghouse 1957 Net Equal to $4.18 a Share

Net income of the Westinghouse Electric Corporation for 1957 was $72,652,000, equal to $4.18 a share on the 16,943,337 common shares outstanding at year end. Chairman of the Board Gwilym A. Price released the figures recently following a meeting of directors.

The directors declared a dividend of 50 cents a share on the common stock, and 95 cents a share on the 3.80 per cent preferred stock, both payable March 1 to stockholders of record February 10.

Net sales billed for 1957 were $2,009,043,000, a record for any year, and the fourth quarter were $531,770,000, a record for any quarter.

AHLMA Plans Management Conference at April Meeting

"Key Management Challenges in 1958 and 1959," a management conference to be directed by members of the management consultant firm of Booz, Allen and Hamilton, will be conducted as a part of the 42nd Annual Meeting of the American Home Laundry Manufacturers' Association, Guenther Baumgart, president, announced recently.

The meeting of the association will be held April 20-22, 1958, at the Boca Raton Hotel and Club, Boca Raton, Fla.

Four management conference seminars have been developed for the meeting, Baumgart reported. Annual meeting members and guests will be divided into four groups, and seminars will run concurrently. Each will be repeated four times, thereby enabling members to attend every session.

Noise Control of Domestic Appliances to Get Spotlight at Appliance Technical Conference

One of the subjects which is to get top billing on the program for the 1958 AIEE Appliance Technical Conference, scheduled for the Morrison Hotel, Chicago, Illinois, May 26-27, is "Noise control of domestic appliances."

Noise level in major home appliances is considered by many management men, and engineers, as one of the most important considerations in appliance design for homes of the future. Based on early interest, the Sub-Committee sponsoring the program feels that this subject will be one of importance to practically everyone of the several hundred engineers who are expected to attend the conference in May.

It was made clear by the committee that this is only one of the features on a well-rounded program of subject material *(program to be presented in* MPM *later)* designed to benefit the appliance engineer and his company.

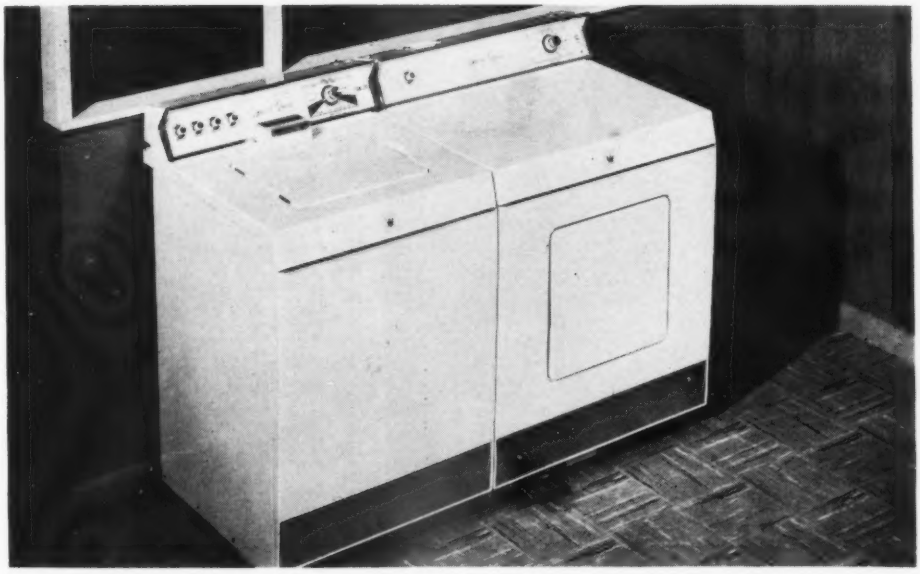
The committee also points out that the Appliance Technical Conference is open to all engineers in the appliance industry, irrespective of whether or not they are members of AIEE.

Any engineers in the industry who would like additional information on the conference should write direct to D. C. Krammes, Chairman Sub-Committee on Domestic Appliances, American Institute of Electrical Engineers, c/o The Hoover Company, North Canton, Ohio.

Purdue to Hold Fifth Annual Industrial Engineering Conference

The Fifth Annual Industrial Engineering Conference, sponsored by the Department of Industrial Engineering and the Division of Adult Education of Purdue University, will be held March 31 - April 1. According to Professor J. A. Ritchey of the Industrial Engineering Department, chairman of this year's program, this will be a practical, down-to-earth examination of the immediate future prospects, problems, and techniques of industrial engineering. It is designed to be of special interest to industrial engineering managers and production managers who, according to Professor Ritchey, can expect to apply many of the ideas presented by the speakers, in planning and organizing for the years immediately ahead. For further information, and a copy of the program, write Professor J. A. Ritchey, Purdue University, Lafayette, Ind.

it takes a lot of careful planning to maintain uninterrupted production of SPEED QUEEN washers and dryers



Speed Queen Multi-Cycle Automatic Washer and Speed Queen Deluxe Automatic Electric Dryer

VITAL LINKS IN THE SPEED QUEEN PRODUCTION STORY ARE • • •

UNIVERSAL SCREWS

Keeping production lines operating smoothly and efficiently is an exacting job that requires careful, intelligent planning and purchasing. We're pleased that SPEED QUEEN, like other leading manufacturers of home appliances, uses Universal Screws in their assembly operations . . . pleased that Universal quality, dependability, and low costs have become an accepted fact in the home appliance field. If you have not yet experienced the plus factors that buying screws from Universal provides there's no better time than now to take advantage of them . . . to put Universal know-how to work for you.

UNIVERSAL SCREW COMPANY

MANUFACTURERS

precision quality fasteners for the appliance industry

2401 Brummel Pl., Evanston, Ill. — Davis 8-0450, Teletype Evanston, Ill. 1767

SALES OFFICES IN DETROIT, CLEVELAND, MILWAUKEE

Porcelain Enameled Panel for Tub Enclosure

At the recent National Association of Home Builders Show in Chicago these porcelain enameled panels were part of an exhibit by Ingersoll-Humphryes and Ingersoll Products Divisions of Borg-Warner Corp. Purpose of the panels was to show building contractors what could be done with this type of product. The panels are backed up with a fiber glass insulation. The angular cutaway of the long panel was purposely made to show the edge view of the panel. *(See Low Temperature Porcelain Enameling, P. 39 this issue.)* **MPM photo**

NAAMM Committees

Fred O. Rippel, president of the Metal Curtain Division of the National Association of Architectural Metal Manufacturers, announced the following committee appointments for the Division:

William H. Withey, Armco Steel Corp., Middletown, Ohio, chairman of the Market Development committee; Richard A. Biggs, Electro Metallurgical Co., New York, N. Y., chairman of the Consultation committee; J. M. Roehm, Kawneer Co., Niles, Mich., chairman of the Research & Development committee; Donald A. Newman, Newman Brothers, Inc., Cincinnati, Ohio, chairman of the Legislative committee; F. A. Loebach, Kaiser Aluminum & Chemical Sales, Inc., Chicago, Ill., chairman of the Membership committee; R. D. Hickman, A. F. Jorss Iron Works, Inc., Arlington, Va., chairman of the By-Laws committee; and Emil M. Pollak, Illinois Bronze Works, Inc., Chicago, Ill., chairman of the Labor Relations committee.

American Welding Society Scheduled for St. Louis

The annual National Spring Meeting of the American Welding Society will be held in St. Louis, Mo., in conjunction with the sixth Welding Show.

Hotel to Feature Gold Colored Aluminum Walls

The new Pittsburgh Hilton Hotel, now under construction and to be completed in 1959, will feature gold-colored aluminum walls. All panels, column covers, and window frames will be fabricated from gold-anodized sheet and extrusions produced from metal supplied by Aluminum Co. of America. To cost $11,000,000, the new Hilton will be located in the heart of the world-famous "Golden Triangle," focal point of Pittsburgh's sweeping renaissance. The building will be 22 stories, with exterior aluminum panels formed into a "shadow-box" effect. The panels will measure nine feet tall and eight feet, four inches wide. More than 300,000 pounds of the light metal will be used on the exterior of the building. The building was designed by Architects William B Tabler and Associates, New York City.

The three-day show will take place at the Kiel Auditorium April 15 to 17 and Hotel Statler April 14 thru 18.

Electric Heating Continues to Hold Top Interest

THE American Institute of Electrical Engineers Winter General Meeting was held in New York, February 2 through February 7, with meeting headquarters at the Hotel Statler.

As a result of increasing general interest throughout the metal products field on the subject of heating with electricity, MPM covered a morning session on Tuesday, February 4, which carried the subject title, "Electric Space Heating and Heat Pumps." This session was sponsored by the Domestic and Commercial Applications Committee, with B. H. Martin presiding.

The session consisted of five comprehensive papers:

"The Challenging Aspects of Electric Space Heating." W. T. Richards, Indianapolis Power and Light Co.

"Heat Pump and Heating Cables Installed in the Same Residence; First Year of Comparative Operation." C. W. Jones and E. E. Linden, The Narragansett Electric Co. (Presented by Mr. Linden.)

"Operating Cost Calculations and Experience of Air-to-Air Heat Pumps." H. N. Eanes, Alabama Power Co.

"Large Heat Pumps." H. E. Rex, Carrier Corp.

"Compound Air Source Heat Pump." R. G. Werden, York Corp.

This program of five papers was presented to a "standing room only" audience, and the subject matter of the papers themselves would assure any listener that electric space heating in general, and heat pumps in particular, are no longer items for future consideration. The number of installations in the domestic field and the number, and size of installations in the commercial and industrial field, leaves no doubt as to the place that the proponents of electric heating are planning for themselves in the future over-all heating picture.

Another point that would impress the listener at this session is the fact that the utilities and the equipment manufacturers are not operating by rule-of-thumb, but are getting around-the-clock and around-the-year information on all types of equipment, which will prove invaluable for future planning.

For an earlier report, see "Electric Space Heating makes its Bid," June, 1957 MPM.)

to Page 72 →

Finishing Systems
by
Metalwash®
Provide BETTER PAINT FINISHES at lower unit cost
Achieve GREATER PRODUCTIVITY in smaller floor area
Create NEW SAVINGS in labor, materials, time
TO HELP YOU IMPROVE YOUR PAINTING OPERATIONS Metalwash maintains a staff of Finishing Systems specialists available, at your request, for a free survey of your requirements.
Because of the critical nature of the Finishing System we cannot overemphasize the importance of a thorough analysis to determine the proper method of cleaning, paint application, paint curing, and conveying for your specific situation — before you even approach the planning stage of your new Finishing System.
Metalwash Finishing Systems specialists are located in principal cities in the United States and Canada. Write today for your free Finishing System survey.
Available on request, the new
Metalwash Finishing Systems catalog
Finishing Systems
by
Metalwash
Metalwash
WASHERS • PICKLERS • PHOSPHATERS • DRYERS • FINISHING SYSTEMS

PRODUCTION MORE THAN TRIPLED . . .
PAINT MILEAGE INCREASED 75% WITH

Ransburg
NO. 2
PROCESS

One Ransburg reciprocating disk uniformly coats 7 complete sets of gasoline pump housings and parts per gallon of paint. Former hand spray produced only 4 sets per gallon.

● Bowser, Inc. Fort Wayne Division is continuously on the lookout for improved manufacturing methods in the production of their quality line of gasoline pumps.

That's why they modernized their finishing department . . . installed a conveyor . . . new oven . . . and replaced hand spray with one RANSBURG No. 2 PROCESS reciprocating disk unit.

RESULTS? Paint mileage increased 75% with less labor. With hand spray, they painted enough pump housings and parts for 4 pumps per gallon of paint. Now, with *Electrostatic*, they're painting 7 complete pump sets per gallon.

Where Bowser formerly needed two shifts in finishing, one shift now handles even greater production. With hand spray and limited oven facilities, they used to turn out 15 sets per hour. Now, they can paint 55 sets an hour, either prime or finish. Color changes are made quickly and easily with Ransburg equipment, and because of its efficiency in operation, maintenance cost in the paint area is cut 50%.

NO REASON WHY YOU CAN'T DO IT, TOO!

Whatever your product, if it's painted, we'd like to tell you more about the worthwhile savings and advantages which can be yours with RANSBURG ELECTROSTATIC PAINTING PROCESSES. Write for our No. 2 Process brochure which cites numerous examples of electrostatic spray painting on a wide variety of products.

Ransburg **ELECTRO-COATING CORP.**
Indianapolis 7, Indiana
RANSBURG

☆ ☆ ☆ ☆ ☆ ☆

COMING FEATURES

DESIGN

DESIGN FOR A LAWN MOWER

CIRCUIT BREAKERS — TYPES AND USES IN THE APPLIANCE INDUSTRY

FABRICATION

FABRICATION AT THE NEW BRIGGS PLANT

FINISHING

PORCELAIN ENAMELING AT THE NEW BRIGGS PLANT

ORGANIC FINISHING AT M-E-L DIV. FORD PLANT

PORCELAIN ENAMEL FOR ALUMINUM

GENERAL

5TH ANNUAL MPM MARKET AND STATISTICAL REVIEW

LATEST DEVELOPMENTS IN CURTAINWALL CONSTRUCTION

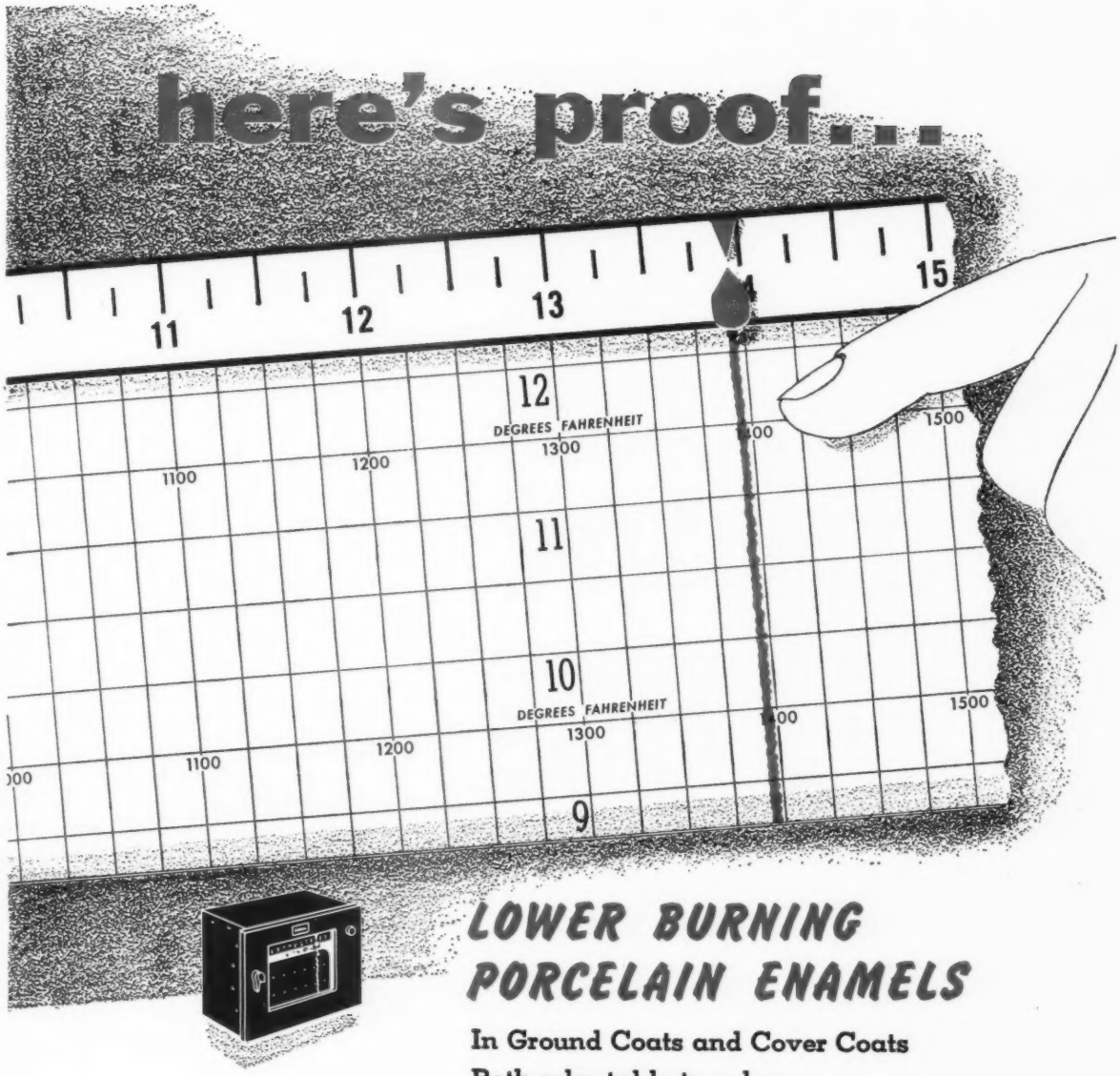
PRODUCTION

PRODUCTION OF VENDING MACHINES BY THE WORLD'S LARGEST PRODUCER

Handbook of Facts on Baking Ovens

This 20 page book contains comprehensive information on various types of ovens. It also provides information on heat energy and its relation to fuel. A discussion on oven design covers: *energy, absorption of heat, radiation loss, ventilation loss,* and *recirculation fan capacity.* In addition the following subjects are covered: *choosing the correct fuel, approximating fuel consumption, oven exhaust requirements, temperature charts, the function of control panels, common formulas in heat evaluation, and how to make basic oven decisions.*

For your copy write: Readers Service Dept., MPM, York St. at Park Ave., Elmhurst, Ill.



LOWER BURNING PORCELAIN ENAMELS

In Ground Coats and Cover Coats
Both adaptable to color . . .

with NO SACRIFICE in QUALITY

AGAIN Ing-Rich "KNOW HOW" proves its high value to our Frit customers . . . the result of that rare combination of top flight ceramic engineers working hand in hand, day in and day out with practical technicians in our large job enameling plant.

When you think it through, we are sure you'll agree that it's mighty hard to beat the rare combination of the scientific approach PLUS practical "KNOW HOW". . . and . . . that's just what you get when you are an Ing-Rich Frit customer.

ING-RICH
FRIT
"The Plant Tested Frit"

INGRAM-RICHARDSON, INC.
OFFICES, LABORATORY AND PLANT
FRANKFORT, INDIANA

Program for PMI 1958 spring technical meeting

THE NINTH spring technical meeting of the Pressed Metal Institute will be held at the Sheraton-Cadillac Hotel, in Detroit, March 12-14. The meeting is sponsored annually by the PMI Technical Research, Standards and Safety Committees.

Wednesday—March 12, 1958

A. M.

President's Welcome: Clint E. Stryker, president of Maysteel Prod., Inc., Milwaukee.

Better Stampings with Modernized Equipment

A panel discussion by press builders and affiliated suppliers to show stampers how to save money, increase productivity, and produce a better product. A question and answer period will follow.

Luncheon: Dr. A. Conrad Posz, Michigan State University.

Subject: "A Handful of Stones." This talk will tell how to improve inventiveness.

P. M.

Round Table Discussion: Supplemental Operations in a Stamping Plant, Press Maintenance and Modernization, Die Maintenance and Related Problems, Cost Reduction in Handling Dies and Stock In and Out of Presses. At the close of the session, group leaders will each give a separate report on findings of their group before the combined audience.

Thursday—March 13, 1958

A. M.

Save Money with a Sound Safety Program

This speaker is a "firecracker". Some of the subjects he will discuss are: Ways and means in decreasing premiums; the trend towards larger settlements. He will answer questions on ways to save money and increase productivity.

Hand Feeding and Ejecting Methods Save Money

An illustrated panel presentation of practical and safe methods of ejecting and feeding stock, removing scrap, etc., through the use of modern manual tools and devices.

Luncheon

Presentation of PMI's Safety Awards.

The Court of Last Resort

A panel representing: management, production, die design engineering, safety, maintenance, and a press builder will answer questions and problems on safety raised by members of the audience.

Friday—March 14, 1958

A. M.

Plant Tours

Chartered buses will be available to visit two extremely interesting and diversified stamping plants: Advance Stamping Company, 12205 Dixie Avenue, and Detroit Stamping Company, 350 Midland Avenue.

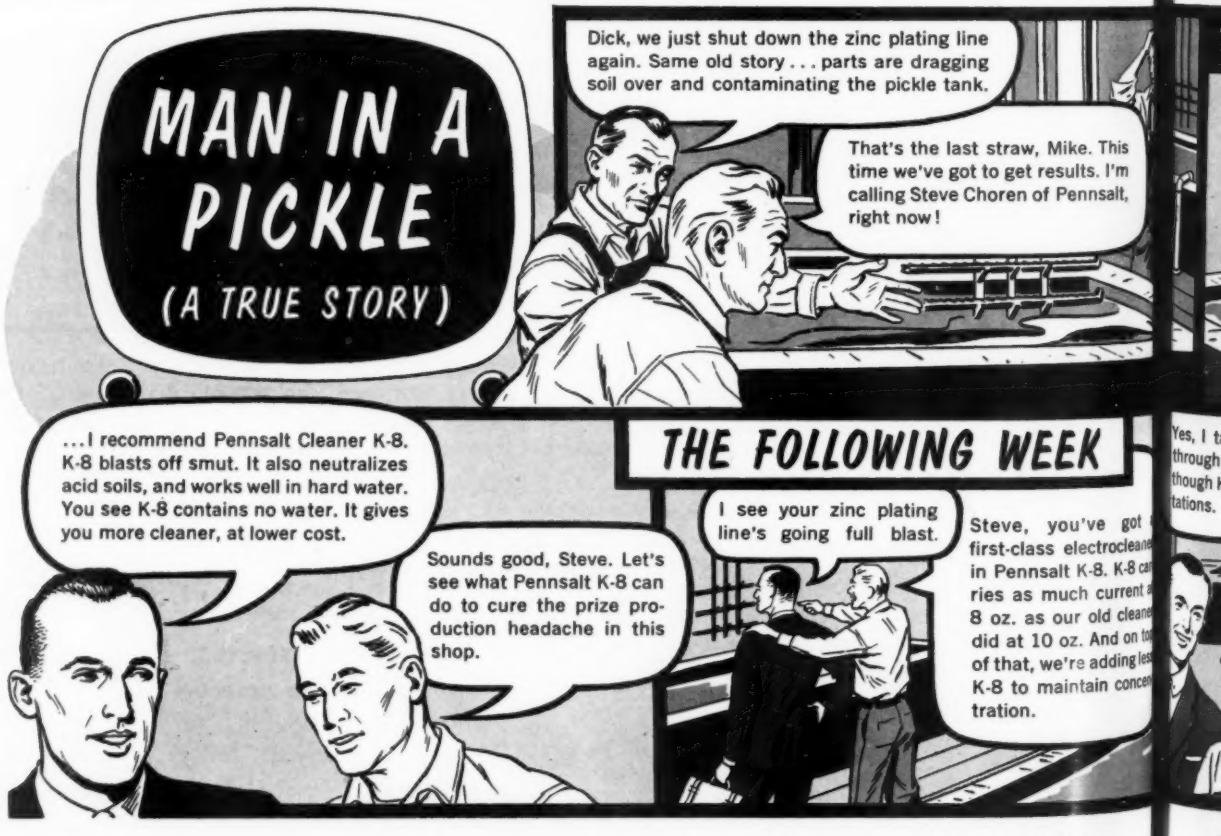
Luncheon

Mr. F. R. Widmer, Republic Steel Corporation, Cleveland, Ohio, on "Planning for Tomorrow's Opportunities".

Featuring: Presentation of the John Woodman Higgins Award.

P. M.

A floor discussion and review of the highlights of the plants visited during the morning with questions from the floor answered by men from these companies.


MAN IN A PICKLE
(A TRUE STORY)
Dick, we just shut down the zinc plating line again. Same old story . . . parts are dragging soil over and contaminating the pickle tank.
That's the last straw, Mike. This time we've got to get results. I'm calling Steve Choren of Pennsalt, right now!
. . . I recommend Pennsalt Cleaner K-8. K-8 blasts off smut. It also neutralizes acid soils, and works well in hard water. You see K-8 contains no water. It gives you more cleaner, at lower cost.
Sounds good, Steve. Let's see what Pennsalt K-8 can do to cure the prize production headache in this shop.
THE FOLLOWING WEEK
I see your zinc plating line's going full blast.
Steve, you've got
first-class electroclean
in Pennsalt K-8. K-8 ca
ries as much current a
8 oz. as our old cleane
did at 10 oz. And on to
of that, we're adding les
K-8 to maintain concen
tration.

Housewares Show

→ *from Page 29*

ish on aluminum. According to Herbert Blakeslee, vice president and general manager of the Cory Corp., "market response has been very good to Cory products, and the trade has been very responsive to new items. It is my belief that business will pick up considerably before the summer of 1958."

W. H. Sahloff, vice president of the Housewares and Radio Receiver Division of General Electric Co., strongly feels that "the optimism at the show has been very noticeable. The year 1958 will be very good for small appliances."

Sunbeam Corp. executives Edward Ploner, vice president and regional sales manager, and Fred A. Genck, manager of national dealer sales, felt that future business looked very good for small appliances.

Mixed reactions were experience by other manufacturers, especially those making smaller metal products of a general housewares nature. Some reactions were very good as far as orders for the current year are concerned, while others were somewhat disappointing.

A. W. Bahder, sales development manager for Landers, Frary & Clark, manufacturers of Universal small home appliances, felt very confident that their new $14.95 coffee maker will attract a large market in this highly-competitive field. He said, "We expect increases that will begin before the first quarter of this year is over. Already the business upturn in our orders is ahead of last year."

E. M. Robinson, executive vice president, United States Stamping Co., a porcelain enamel kitchen ware manufacturer, said, "This was a very good show. The response on our Gourmet line was very good. The traffic through our booths was very heavy."

Infra-red heating

→ *from Page 53*

such as used in the metal curtain wall field, and in appliance cabinet construction. *(See January* MPM, *"Metal-Foam-Metal Sandwich Construction for Appliance Cabinet Construction").* Most of the adhesives used for bonding metal to insulation are thermo-setting; therefore, they require heat for curing. The application of infra-red heating for curing thermo-setting adhesives is excellent because the areas usually requiring heat are flat and can, therefore, utilize radiation very well.

Other applications

Small portable pieces of infra-red equipment can be adapted to heat, temporarily, certain areas of a plant in cold weather. These same pieces of equipment can also be used to increase the output of an already existing infra-red installation. Wherever heat is required, either temporarily or in permanent installations, the promise of efficiency and flexibility that infra-red heating equipment offers is one to be considered.

While this article has concerned itself with conventional sources of infra-red heating for applications below 700° F., a great deal of work has been done during recent years with higher temperature equipment for building metal temperatures to the near-1000° F. range.

It is easy to see how the already extensive field of applications could be further broadened as a result.

One of the applications that is receiving attention is for the maturing of extremely "low temperature" ceramic coatings, such as porcelain enamels for aluminum.

Should the higher temperature heat sources prove practical in production from the standpoint of original cost and cost of operation in the 1000° F. range, case history information will be reported at a later date.

. . . so I figured maybe you could help us, Steve. The cleaners we've been using just aren't getting the heavy oil and carbon smut off these parts. Got any suggestions?
Looks like your job calls for a real heavy duty electro-cleaner, Dick, one that delivers top performance even when your tanks are heavily contaminated with soil. That's why . . .
Yes, I talked to the boys as I came through the shop. Sounds to me as though K-8 surpassed even my expectations.
Ours too, Steve. K-8 is doing a whole of a job. I can honestly say that we wouldn't change materials now even if we were offered another cleaner at lower cost.

Makes good sense to improve metalworking with chemical know-how . . . gained from wide experience in the field. Call in your Pennsalt salesman. He can help you to "A BETTER START FOR YOUR FINISH"

METAL PROCESSING
DEPARTMENT 570
PENNSALT CHEMICALS CORP.
3 Penn Center, Philadelphia 2, Pa.

Pennsalt Chemicals
ESTABLISHED 1850

A better start for your finish

AT THE HUB OF INDUSTRY IN THE HEART OF AMERICA

Here at Fahralloy we believe in giving service as well as manufacturing top quality heat and corrosion resisting castings. In fact, service is a keystone upon which our business has grown over almost a quarter of a century. Sitting here at the hub of industry in the heart of America we're never more than a few hours away from you at most. No matter what your problem may be if a heat and corrosion resisting casting is involved, you'll find the solution at Fahralloy. Try us and see for yourself.

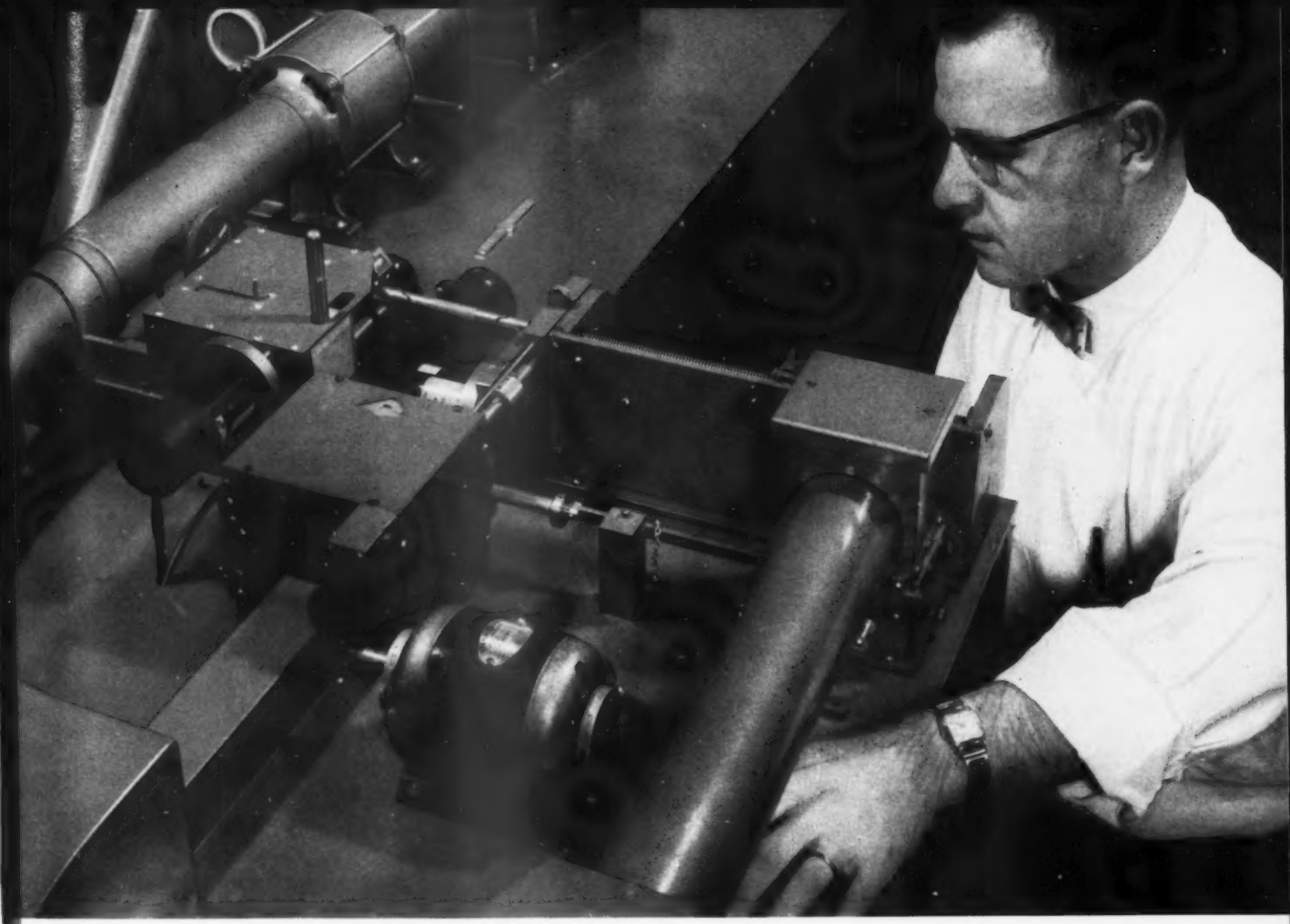
Fahralloy serves the nation and the nation's leading industries with heat and corrosion resisting castings.

- **AIRCRAFT**
- **APPLIANCE MANUFACTURERS**
- **ARMED FORCES**
- **AUTOMOTIVE**
- **CHEMICAL**
- **DRUG**
- **FARM EQUIPMENT**
- **FOOD PROCESSING EQUIPMENT**
- **GENERAL MANUFACTURING**
- **PUMP MANUFACTURERS**
- **STEEL**

THE FAHRALLOY CO.

150th & Lexington Ave. — Harvey, Illinois

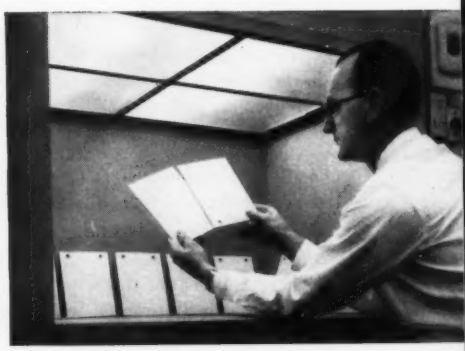
In Canada — Fahralloy Canada, Ltd., Orillia, Ontario



Color matching of two different finishes or materials is done quickly and accurately with the SPECTROPHOTOMETER, revealing the "tri-stimulus" values (a numerical system of evaluating colors).

New AUTOMATIC COLOR DIFFERENCE METER measures the variance in reflectance factor, important in color-correcting.

Final "answers" are found quickly in Ferro's PRODUCT DEVELOPMENT LAB where a *dozen variations* of a formula can be checked at one time.



Checking colors under different lighting is essential where different-type finishes must match.

...takes the mystery out of porcelain enamel color matching

FERRO

Skilled technicians with the newest in scientific instruments can save you needless headaches in developing or matching colors. This is particularly valuable when you must match porcelain enamel with an organic finish (technically, dissimilar materials often possessing different metameric properties).

Here at Ferro, color matching is a routine part of our business. And because we produce both frit and color, also produce frit with the color *smelted in* for large production requirements, you can be sure that the formula we give you will *work*, and work out well in *your* plant.

FERRO CORPORATION 4150 EAST 56TH ST. • CLEVELAND 5, OHIO

Where is COLOR heading in the metal products field?

(Continued from Page 47)

Question: What influence does color have on the marketing of metal products?

Mr. Slocum points out that, as far as the home purchaser is concerned, he or she is more likely to be influenced by the "mass" display of color, such as a complete kitchen or a complete room, rather than by an individual appliance on the floor by itself or in with white appliances. Mr. Greenberg points out that the color goes far beyond the individual product to be sold. He cites the large department stores where, for instance, recomemnded color schemes are for a complete store, including walls, ceilings, draperies, display racks, and all the components of a completely-equipped display room. Here, he said, the basic concept of color changes from merely the factor of cleanliness, failure to retain dirt and such practical aspects, and turns instead to using color for marketing purposes.

Question: When different metal products are to be brought together in office or home, what do you consider the best colors for "mixed products?"

Mr. Greenberg cites beiges and grays as desirable colors from the standpoint of mixing with a variety of other shades. Mr. Slocum stands for the pastel shades as being the most practical, for the reason that they will blend, and they will give the user a choice of more than one color and, at the same time, mix into a desirable general effect.

Question: What do you think of some of the darker colors that have been used on major home appliances?

Mr. Greenberg makes the point that it is possible that the users of these colors have not taken into consideration the great variation in the brightness and color of light in the home; for example, the contrast between full sunlight and low intensity artificial lighting. Mr. Slocum cites the experience that, where a product manufacturer is offering the dark or "off" shades along with the light or pastel shades, pink, yellow, and blue-green, in that order, are the colors that are selling.

Question: What are the formulators doing in metal finish development?

Mr. Greenberg outlined three development trends in formulation.

1. There is constant development of lower temperature-cure finishes that will require less time in the oven. In other words, the ratio of time and temperature should be reduced to the point where it would obviate any possibility of organic finishing line holding up increased speed of production.
2. Development work is constantly being conducted to increase chemical resistance and increase hardness, without losing the required flexibility of the film.
3. The third development is the gradual elimination of the volatile solvents in the chemical constituents of the finish in order to eliminate fire hazards and unnecessary costs.

Finally: What is the outlook for 1958 and 1959 in color?

Mr. Greenberg is of the opinion that a greater and greater trend will be seen toward color. There is less and less dependance, he says, on the so-called interior decorator home for color use, and greater demand by the average home owner. The average home owner has become more courageous and more adventuresome in the use of color. It shows up in a great deal of color being used for all purposes in the home and, of course, in metal finishes. The same thing is true in the office. Where, years ago, only drab colors were considered in offices, the average executive is now willing to experiment in order to brighten up and harmonize the office.

Mr. Slocum and Mr. Greenberg agreed that the trend to the use of color in metal products is upward. They offered a consensus of opinion that the "shake-down" period in colors is past in that the great variety offered for metal products is decreasing. There will be no attempt at standardization, they feel, but a decided effort to "tie down" the colors for appliances and other metal products.

Apples and sour grapes

could a psychologist give a more accurate estimate than an economist?

by John C. Sharp
PRESIDENT, HOTPOINT CO.

IF WE USE OUR HEADS for something more than hatracks *during 1958*, I am confident we can continue to move ahead.

The year 1957 saw a continuation of the join-in, drop-out, and fall-out trend that had been going on for some time in the appliance industry. Old familiar names continued to disappear from the market, or reappear as part of a new name.

I think it's reasonable to assume this trend has about run its course. The players are in place now, and a new kind of ball game is ready to start.

This industry of ours is growing up — dusting off the know-how and hard-hitting salesmanship that has been tucked away on the shelf for so long. And, whether some of the younger people agree or not, it was this guts and gumption that made our industry great in the first place.

In some ways, 1957 was a little disappointing. Total Hotpoint business was slightly below 1956, but well ahead of 1955. And if you will think back, Hotpoint broke every sales record in its history that year — even topping the abnormal peaks caused by the Korean War in 1950!

If those are the facts then, why all the long faces and talk of "gloom" and "doom." Some products fell behind sales forecasts. But others, such as dishwashers and built-in ranges, made gains of up to 30 per cent in some markets.

I humbly suggest that some of the country's economists are comparing apples and sour grapes: and not apples and apples! I also think that at this point a psychologist could give a more accurate estimate of the *current* year than an economist!

See us...

...for the very best in perforated metals!

To be sure of your quality, price and delivery on all perforated metals, plastics and hardboards, specify STANDARD! Keep the facts at your fingertips!

ATTACH THIS AD TO YOUR LETTERHEAD AND MAIL FOR OUR NEW FREE CATALOG!

Standard stamping and perforating co.

3153 West 49th Place, Chicago 32, Ill.

All perforated materials • bending • forming • welding • tooling • finishing

when you want "more" than just castings-

contact us for:

constant quality

on-time delivery

patterns from blueprints

free estimates

modern facilities

... 100 years' experience is at your service when you write:

Foundry Contract Division

PHILLIPS & BUTTORFF CORP.

Nashville 3, Tennessee

For the name in front...

DIE CAST NAME PLATES

Positive product identification must meet exacting specifications for beauty, durability, and design flexibility. LaFrance specializes exclusively in three-dimensional die cast name plates and decorative trim — with complete design and production facilities. Send for free sample and additional information.

La France® PRECISION CASTING CO.

2003 S. 29th Street
Phila. 45, Pa.
HOward 5-7106

INDUSTRY PERSONALS

Gordon G. Hurt, national merchandising manager for Norge Div., Borg-Warner Corp., Chicago, has assumed direction of Norge home appliance advertising.

Judson S. Sayre, president, said that Hurt will be responsible for all national and cooperative advertising, as well as merchandising.

Harley Earl, president of Harley Earl Inc., Detroit Industrial Design firm, announced the following appointments: **James G. Balmer** to executive vice president from general manager; **William H. Armstrong** to vice president from director of design; and **Jerome C. Earl** to vice president from secretary.

HURT

BALMER

The appointments of three regional sales managers for the electric utility division of Whirlpool Corp. were announced recently by C. R. Armstrong, general sales manager of the division.

The individuals named, and their locations, are: **H. B. Cromleigh,** headquarters New York, N. Y.; **Roy C. Forward,** headquarters Atlanta, Ga.; and **Willard Rowlett,** headquarters Chicago, Ill. Cromleigh and Forward will divide their time between electric utility and builder sales. Rowlett will be exclusively on utility sales.

The appointments of six regional sales managers for the gas utility division of Whirlpool Corp. were announced recently by Robert M. Marberry, general sales manager of the division.

The individuals named, and their locations, are: **David F. Muir,** east region; headquarters New York, N. Y.; **Riley N. Stone,** southeast region; headquarters Atlanta, Ga.; **Robert Champion,** east central region; headquarters Cleveland, Ohio; **Paul Armbruster,** west central region; headquarters Chicago, Ill.; **Robert H. Mayo,** southwest region; headquarters Dallas, Tex.; and **Stephen E. Upton,** west region; headquarters Los Angeles, Calif.

The resignation of **K. O. Dupree** as director of sales, Avco Manufacturing Corp., AK Div., effective February 1, 1958, was announced by Curry W. Stoup, Avco vice president and general manager of the Division. Dupree stated that he was resigning from Avco to accept an executive position with another company with headquarters in Atlanta, Ga.

Richard G. Norsworthy is now associated with the Ceramic Research Laboratory of the A. O. Smith Corp., Milwaukee, Wis. He will work in production research and development.

Henry C. Wesson has joined the Republic Heater Division of Odin Stove Mfg. Co., Erie, Pa., as assistant plant superintendent in charge of porcelain enamel. For ten years prior, he was superintendent of the enameling division of Heintz Mfg. Co., Philadelphia, Pa.

ARMSTRONG

EARL

Thomas W. McNeill has been appointed director of procurement of American Radiator & Standard Sanitary Corp., Joseph A. Grazier, president, announced.

In this position, McNeill will develop purchasing policies for raw materials and supplies of major importance, and negotiate corporate purchasing agreements on specified items.

Two promotions at Overly Manufacturing Co., Greensburg, Pa., manufacturer of architectural metal products, have been announced by H. W. Wehe, president.

Fred G. Wehe, Jr., formerly sales engineer in the Architectural Sheet Metal Dept., has been named assistant to the vice president. He has been engaged in sales activities since joining Overly in 1952.

F. C. Petters, formerly estimator in the company's Overline Entrance Division, succeeds Fred Wehe as sales engineer in the Architectural Sheet Metal Dept. He joined the company as a draftsman in 1953.

Herbert R. Spencer, Jr. has been elected president of The Erie Enameling Co., Erie, Pa., in an action taken by the board of directors January 30. He will continue to serve in the capacity of treasurer. **Herbert R. Spencer, Sr.,** formerly president of the company, has been elevated to chairman of the board. **Robert E. Braggins,** executive vice president, was named secretary.

The Erie Enameling Co. specializes in the engineering and production of porcelain enamel veneer panels, insulated porcelain enamel curtain wall panels, and industrial porcelain enamel finishing.

C. P. Carlson has been named general sales manager, Superior Metalware Div., John Wood Co., in an overall expansion of Superior's sales organization. **Harvey Bingham** has been named sales manager, dairy metalware products, **Frank Aymond** has been appointed sales manager of industrial products, and **Reed P. Harris** will be district supervisor for Superior in eleven Western states, according to J. N. Welscher, Superior vice president and general manager.

Norman Wicks has been named executive director of the new Plumbing-Heating-Cooling Information Bureau. The appointment was announced by W. A. Landers, president of the Bureau.

For the last two and one-half years, Wicks has served as manager of advertising and sales promotion for the General Precision Laboratory, Inc., Pleasantville, New York, a leading manufacturer of closed-circuit television systems.

WESSON

WICKS

NEWS about Suppliers

J&L Stainless Steel Division to Open Los Angeles Office

The Stainless Steel Division of Jones & Laughlin Steel Corp. has opened a Los Angeles sales office, it was announced by John H. Abbott, division vice president — sales.

The new office is located in the Continental Companies Building, 2795 Wilshire Boulevard, Los Angeles 5.

John E. Cottier, Jr., 19060 Santa Rita St., Tarzana, Calif., has been appointed manager, Los Angeles district sales for the division. He will be headquartered in the new office. Cottier formerly was with J&L's Strip Steel Division.

Youngstown Sheet and Tube Sales for 1957 Set New Record

Despite a modest decline in the shipment of steel products during 1957, The Youngstown Sheet and Tube Co. recently reported a record $688,245,862 from sales and other revenues. This figure compares with the previous high of $684,041,021 established in 1956.

Net income was $42,508,579, or $12.35 per share in 1957, compared with $43,171,587, or $12.62 per share, in 1956.

Hoover Tool & Die Occupies New and Larger Plant

Final installation of machinery and equipment marks the completion of the new Hoover Tool & Die Co. plant at 5775 E. 10 Mile Road, Centerline, Mich. John J. Paulus, president and general manager, announced this step in the company's growth and expansion.

The new plant, located in the industrial area just northeast of Detroit, embodies 63,000 square feet, including 4,500 square feet for the engineering department, and 5,000 square feet of office space.

Aluminum Usage Shows Steady Upward Trend, Report

Aluminum usage in America's 1958 passenger car has climbed a record 29 per cent above last year to an average of 52.40 pounds per car, Aluminum Co. of America announced recently.

Alcoa's annual comprehensive survey of aluminum applications in passenger

cars indicates the auto industry is using almost one-third more of the bright metal than in 1957, when the survey showed the average car employed 40 pounds.

This means more than 288-million pounds will be used in the 1958 model year, if the industry produces autos at a 5.5-million car annual rate.

Sales Headquarters for Olin Aluminum Moved to New Location

National sales headquarters for the Olin Aluminum division, Olin Mathieson Chemical Corp., have been moved to the newly-completed office building at 400 Park Ave., New York.

Olin Aluminum is the trade mark for aluminum produced by Olin Mathieson. With the start of full production next year at their rolling mill in the Ohio River Valley, Olin Aluminum will assertedly become the nation's fourth largest aluminum company. Production is currently under way at three plants located in Chattanooga, Tenn.; Gulfport, Miss.; and Riverside, Calif.

Wyandotte California Districts Win Sales Award

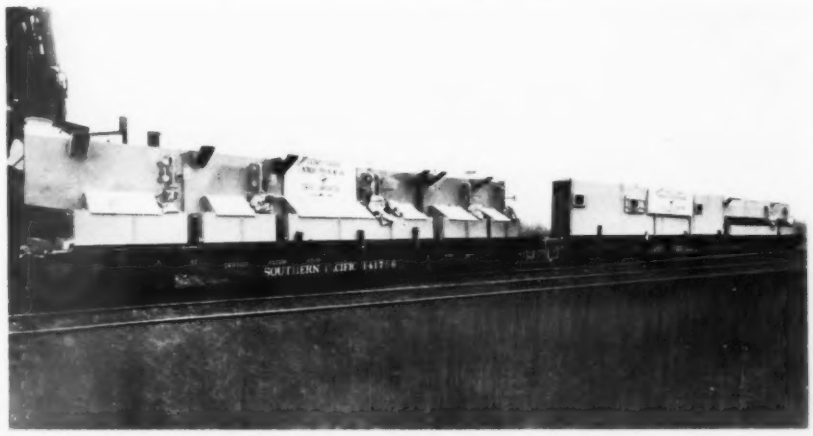
Tom Todd, Los Angeles district sales manager, received a first-place award at the annual district sales managers conference of the J. B. Ford Division of Wyandotte Chemicals Corporation at The Greenbrier, White Sulphur Springs, W. Va. On behalf of the California district sales-service force, Todd was awarded a certificate for achieving first place in selling the company's Industrial and Aircraft Department products. This presentation was made by P. N. Burkard, manager of the department.

New Ferro-Curran Continuous Spray Pickling Machine

The first automatic Ferro-Curran continuous spray pickling machine was recently shipped to the American Radiator and Standard Sanitary Corporation plant in Richmond, Calif., from Ferro Corporation headquarters in Cleveland.

More than 110 feet in length, the entire machine was shipped assembled in four sections on board two regular railroad flatcars to the customer's plant in order to minimize the time needed for installation. The only job site erection required was the bolting of the sections together, the connection of utilities, the attachment of exhaust stacks, and the installation of a conveyor system.

The completely-enclosed machine incorporates emulsion cleaner, hot water, alkali cleaner, hot water, fresh water, sulfuric acid, fresh water, nickel sulfate, acid rinse, first neutralizer, second neutralizer, and dryer sections in that order, and is capable of processing 40 bath tubs per hour.



L.O.F. Glass Fibers Building California Plant

Contracts for the construction of a glass fiber manufacturing plant in Corona, Calif., costing in excess of $1,000,000 have been let and construction has already begun, it was announced by G. P. MacNichol, Jr., chairman, and R. H. Barnard, president, L.O.F. Glass Fibers.

The new plant, for which a completion date of August 1, 1958 has been set, will be devoted to the manufacture, fabrication, and warehousing of the complete line of L.O.F. Glass Fibers' insulation products, including its newly-introduced pipe insulation.

Five Awards Presented at Pemco Annual Dinner

John Zingor, (right) newly-appointed regional sales manager for the Northern Enamel Division of Pemco Corp., shows the Heinrich and Karl Turk Merit Award medal which went along with a $500 saving bond for his outstanding contribution to the company in 1957. Charles P. Lohman, vice president, made the award. Four other merit awards were presented to Pemco personnel at the Thirty-first Annual Dinner held recently.

Four Ferro Employees Receive Weaver Awards

Four Ferro Corp. employees were the recipients of that firm's 1957 Robert A. Weaver Awards at the annual dinner meeting of Ferro's Key Group organization recently.

Presented with special certificates and cash awards were Michael Bozsin, chief chemist; Robert L. Tycast, frit and glaze division; John N. Rodgers, sales engineer, Los Angeles plastic color department; and Ralph C. Riggs, manager of Ferro's Huntington Beach, Calif. fiber glass plant.

Alert Supply Company Acquired by H-VW-M Co.

Alert Supply Co. of Los Angeles has been acquired by Hanson-Van Winkle-Munning Co., Matawan, N. J., it has been jointly announced. H-VW-M, established in 1820, is a manufacturer of electroplating and anodizing equipment, processes, and supplies.

Alert, a large West Coast manufacturer of buffing compounds, will retain its corporate identity as a subsidiary of H-VW-M. The firm was organized in 1950. The Alert management will continue with all personnel holding the same responsibilities. Western sales and technical staffs of Hanson-Van Winkle-Munning will join the Pacific Coast firm under the direction of Alert President Alfred E. Perkins. The Hanson-Van Winkle-Munning Western office has moved to the Alert Building at 2041 S. Davie Avenue, Los Angeles. The firm will continue its San Francisco office at 923 Harrison St.

Largest Titanium Plate Rolled for Chemical Process Industry

Fabrication of the largest light-gage plate of titanium ever produced was announced recently by Titanium Metals Corp. of America.

Made of Ti-75A titanium alloy, the plate measures 75 by 224 inches. Nominal thickness is 3/16 inch. The average size of work of this kind is 36 by 72 inches, while the largest piece previously rolled by TMCA was 48 by 120 inches.

DeVilbiss Spray School 1500 Trainees

Students who traveled thousands of miles specifically to attend DeVilbiss spray training school were among the more than 1,500 who were instructed in classes held on an average of more than once a week during 1957, the Toledo equipment manufacturer reports. Students came from many foreign countries.

Getting the inside story firsthand is part of the training at the DeVilbiss spray finishing school. Here David Halse and Dan Valjoen of British Agencies Pty, Ltd., Johannesburg, South Africa, listen as George Haigh, of the DeVilbiss export sales staff, uses a cutaway model to point out the working parts of a paint heater.

Granco Announces New Representatives

Granco, Inc., Grand Rapids, Mich., has announced the appointment of the following companies as distributors of Granco equipment: Edward D. Allen, Associated Material Handling Industries, 7856 S. Ashland Av., Room 210, Chicago 20, Ill., metropolitan Chicago and surrounding area; Elmer A. Skonberg, Finishing Equipment Co., 719 S. Preston St., Louisville 1, Ky., southern Indiana, Kentucky and Tennessee; Ted Law, Law Instrument Co., P. O. Box 95, Angola, Ind., northern Indiana, western Ohio and southern Michigan; Alva W. Naylor, The Charles Moll Co., 1717-19 Oak St., Kansas City 8, Mo., western Missouri, eastern Kansas, Nebraska, and Oklahoma; Frank Schneider, Schneider Equipment Sales, Division of Mutual Research Corp., 905 S. 28th St., Milwaukee 15, Wis.; Wisconsin, Minnesota, and Iowa.

Detroit New Headquarters for Hercules Synthetics Sales

The establishment of Detroit as headquarters for a new synthetics department sales district and the appointment of E. S. Massey as branch office sales manager, were announced recently by James W. L. Monkman, director of sales for Hercules Powder Company's synthetics department.

"The establishment of Detroit as headquarters for a new sales district points up the importance of this industrial area as a consumer of synthetic resins, pentaerythritol, and other chemicals sold by Hercules' synthetics department," Monkman said.

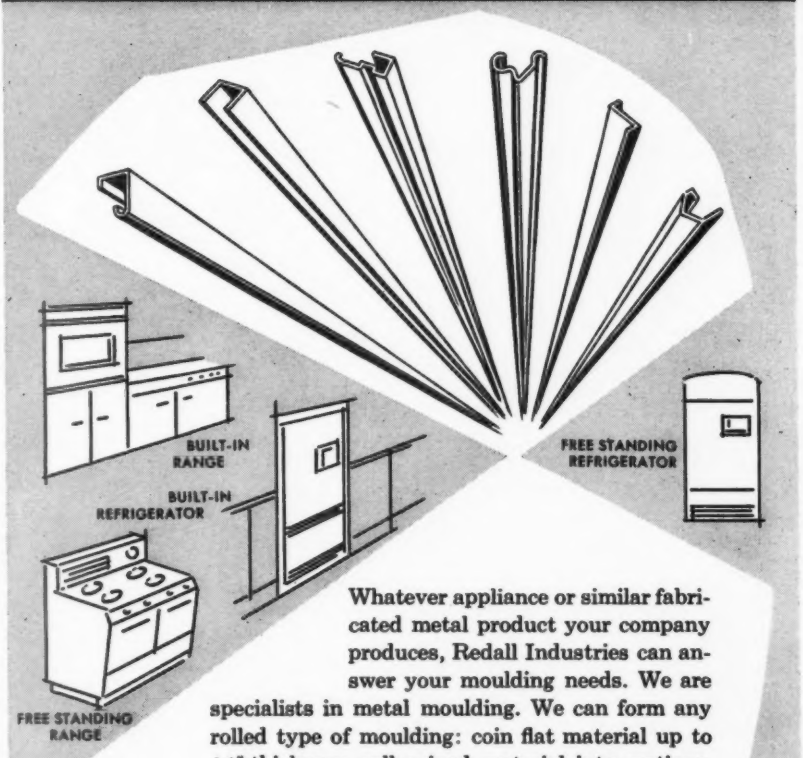
Special equipment boosts production

→ *from Page 27*

veyor that travels along two sides of the area. Power hand tools are supported overhead where convenient to the operators who use them. When an assembly is completed, it is returned to the plant conveyor and is carried to the point where the cover assembly is applied to the main washing machine assembly.

In the cover assembly, lifting and hand shifting are minimized, and operators can always work in most convenient positions. The group works together to such advantage that the higher rate is attained with less fatigue than for the slower rate in the prior setup.

metal mouldings of
QUALITY
for appliances of
MODERN DESIGN



Whatever appliance or similar fabricated metal product your company produces, Redall Industries can answer your moulding needs. We are specialists in metal moulding. We can form any rolled type of moulding: coin flat material up to 1/16" thickness, roll coined material into sections, and roll patterns on metal. We have a wide variety of production mouldings to choose from or we can meet your requirements for custom designs.

In addition to having complete facilities for the production of metal mouldings Redall Industries provides facilities for assembly work, light stamping, and tool and die work.

Write today for complete information

PRODUCTION AND CUSTOM MOULDINGS OF ALL TYPES

Redall Industries
LEXINGTON 1, MICHIGAN

RANGE AND REFRIGERATOR HARDWARE IN STANDARD AND CUSTOM DESIGNS

Make National Lock Company your 1-source supplier for appliance hardware. Distinctively-styled decorative hardware . . . soundly-engineered functional hardware . . . all are included in the complete selection of standard items. Our specialists will work with your designers in creating custom-built hardware to meet your requirements. Write for information and prices.

NATIONAL LOCK COMPANY
Rockford • Illinois

from the Editor's Mail

→ *from Page 16*

Appreciates MPM

Gentlemen: Your February issue of METAL PRODUCTS MANUFACTURING just arrived, and I have just finished reading it. Our advertising manager, Jim Baker, will probably write to you anyway, but I do want you to know how much I personally appreciate the generous treatment you gave our news about the purchase of the Moore Division of the Conlon-Moore Corporation.

Also, I appreciate my personal copy of this publication of yours and find it very interesting each month.

E. M. Douthat, Jr.
Vice President
Locke Stove Co.
Kansas City, Mo.

Wants more reprints

Gentlemen: We have had an excellent reaction to the reprint of METAL PRODUCTS MANUFACTURING "Engineering a Quiet Disposer" among our distributors. It is decidedly possible that some of them may wish to use this reprint for circulation within their own sales areas.

In this regard, we would like to know if additional reprints are available and, if so, at what cost. We anticipate a need for approximately 1,000 to 2,000 additional reprints.

Please give us a prompt response so that we will be prepared for inquiries.

Kenneth B. Miller
Assistant Advertising Manager
Waste King Corp.
3300 East 50th Street
Los Angeles 58, Calif.

DESIGNING OR PRODUCING A UNIT REQUIRING AIR MOVEMENT?...

Investigate

DE-STA-CO **BLOWER HOUSINGS-**

1 **complete line** — components and assemblies for wheels 3¼" to 9⅞" dia. . . . Low unit cost!

2 **exclusive process** — housings assembled by exclusive DE-STA-CO equipment.

3 **all widths** — assemblies for any-width wheel.

4 **easily modified** — most piercing, drilling, forming and spot-welding accomplished without tooling costs.

5 **complete stock** — standard sideplates or integral-inlet type.

Send your prints for quotations! . . . Or, if practical, our experienced engineering staff will recommend an adaptation of a DE-STA-CO Standard Unit, to reduce tooling and other costs! . . . Write for literature and prints!

Investigate DE-STA-CO **DETROIT STAMPING COMPANY**
404 Midland Avenue • Detroit 3, Michigan
•
BLOWER HOUSINGS

performance-tested porcelain enamel **FRITS**

Every batch of Hommel frits must pass the most exacting tests in the ceramic industry . . . giving you complete assurance of receiving the *highest quality* frits that can be produced. From raw materials to the finished product, check after check is made to maintain top quality production.

If you are not now among the many users of Hommel-Quality frits, you owe it to yourself . . . and to your company to try them. Run comparative tests and prove to yourself that you will be dollars ahead. Telephone today . . . contact your O. Hommel representative . . . or write for complete information.

"The Worlds Most Complete Ceramic Supplier"

Dept. MPM-358

THE **O. HOMMEL** COMPANY

PITTSBURGH 30, PA.

WEST COAST • 4747 E. 49th STREET • LOS ANGELES, CALIFORNIA

SUPPLIER PERSONALS

Glen Boyd of Dallas has been appointed regional sales manager for the new Dixie regional office of Brainard Steel Division, Sharon Steel Corporation, and will make his headquarters at 1412 Jeffreys Street in that city. He and his salesmen will cover the South as far east as Charlotte, N. C., and Atlanta, Ga. His region will include eleven Southern states.

J. L. Long will be Brainard's representative in the newly-opened office at 400 Wayside Drive, Houston, Texas. His coverage of Texas will meet the Dallas territory on the north, and will extend west to the New Mexico line, and east to Port Arthur and Beaumont.

BOYD

LONG

John W. Mordica has been appointed Manager of Equipment Sales for Pennsalt's Metal Processing Department. In making the announcement, John M. Davidson, Manager of the Metal Processing Department, points to Mordica's twenty-five years of metal processing experience, including stints with two major steel companies.

The sale of the line of White-Roth metal processing machinery, recently announced by the company (See February MPM) will be under the direction of Mordica. Mordica's headquarters will be located at 1936 W. 19th St., Lorain, Ohio.

Chicago Vitreous Corp., 1425 S. 55th Court, Cicero 50, Ill., manufacturer of porcelain enamel frits, has named **Clifford E. Smith** district manager of Michigan and Canadian territories, according to an announcement by L. A. Johnson, manager of sales and service. He has been in the Chicago Vitreous sales and service organization since January 3, 1937, and upon the recent retirement of Ed Smith was named to his new district manager post. Smith is a member of the Chicago District Enamelers Club and the Canadian Ceramic Society.

Thomas H. Lester was recently appointed general manager of the DeSoto Paint & Varnish Company, Garland, Texas. DeSoto is one of nine divisions of United Wallpaper, Inc., Chicago. Lester succeeded **Walter F. Rhoades,** who was transferred to United's Chicago headquarters as vice president of marketing, a newly-created position in the corporation.

SMITH

LESTER

Max B. Roosa, formerly vice president in charge of sales, has been elected executive vice president of Parker Rust Proof Co., Detroit manufacturer of surface treatments for metals.

Roosa has been with Parker since 1936. Beginning as a research chemist, he was made sales manager in 1951 and vice president, sales in 1952.

Harry T. Marks, executive vice president, was elected president of Ferro Corp. recently at a meeting of the firm's board of directors, it was announced by Robert A. Weaver, board chairman and chief executive officer of the Cleveland concern. Marks, a 25-year veteran of Ferro, will continue to carry out his present duties while assuming the position made vacant early this month by the sudden death of C. D. Clawson, Weaver stated.

Born and educated in Canada, Marks first joined the concern's Canadian subsidiary in 1933 as plant superintendent, and subsequently has held the positions of export manager at the company's Cleveland headquarters, managing director of Ferro Brazil, manager of the international division, vice president-foreign operations, vice president-administration, and, in 1955, he was advanced to executive vice president.

Appointment of **H. F. Jacobsmeyer** as sales manager of Grayson Controls Division, Robertshaw-Fulton Controls Company, was announced recently by Wilbur Jackson, vice president and divisional general manager.

Jacobsmeyer, former district sales manager for Grayson Controls, replaces **A. W. Beck** who recently was named marketing vice president for the company.

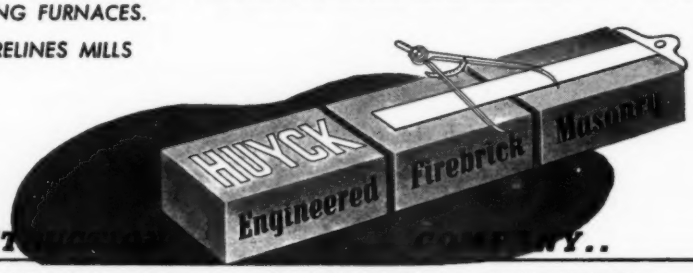
MARKS

JACOBSMEYER

(more Supplier Personals on Page 91)

HUYCK *FURNISHES FIREBRICK MASONRY TO BUILD, REBUILD AND REPAIR ALL TYPES OF: ENAMELING FURNACES . . . FRIT SMELTERS . . . ALUMINUM, BRASS, LEAD SMELTERS . . . FORGE FURNACES . . . HEAT TREATING FURNACES.*

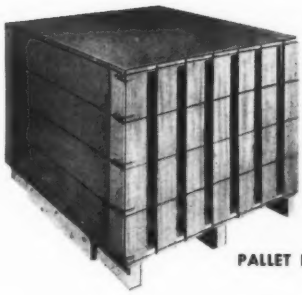
HUYCK *LINES AND RELINES MILLS*



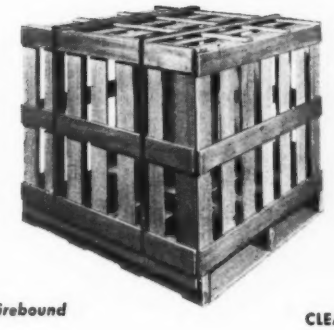
HUYCK *MASONRY IS GUARANTEED TO GIVE YOU BETTER PERFORMANCE AND LONGER LIFE*

Huyck CONST... COMPANY..

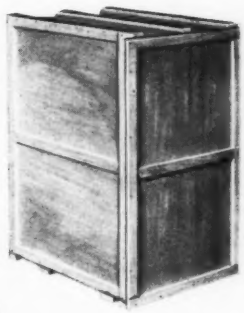
1861 DeCook Avenue • Park Ridge, Illinois • TAlcott 3-0612



PALLET BOXES — *Wirebound*

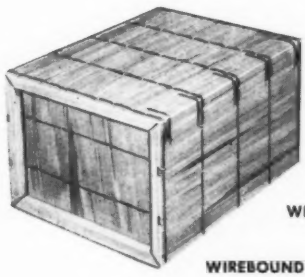


PALLET BOXES — *Hinged Corner*



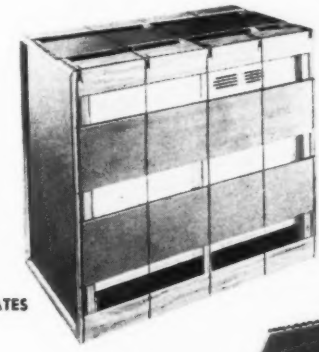
CLEATED BOXES

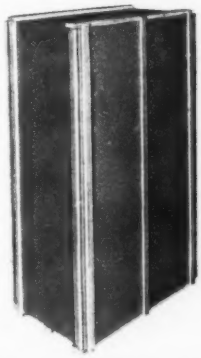
We make 'em all



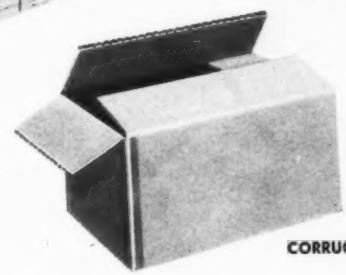
WIREBOUND CRATES

WIREBOUND BOXES





E-Z PAK CLEATED CORRUGATED
(Watkins Type)



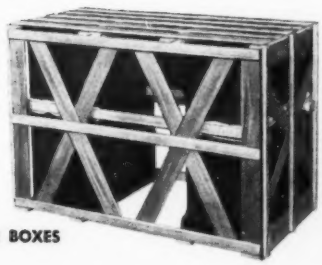
CORRUGATED

you can be sure . . . .

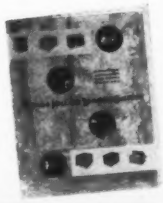
that recommendations from Chicago Mill are based on impartial, unbiased decisions because we manufacture the most diversified line of shipping containers in the country!

Materials used include—

Plywood • Craveneer • Corrugated • Veneer • Resawed



HINGED CORNER CRATES OR BOXES



FREE! *Illustrated catalog showing the various types and applications of Chicago Mill containers, Chicago Mill's services.*

CHICAGO MILL AND LUMBER COMPANY

33 South Clark Street — Chicago 3, Illinois

PLANTS

- CHICAGO, ILLINOIS
- GREENVILLE, MISSISSIPPI
- HELENA, ARKANSAS
- ROCKMART, GEORGIA
- TALLULAH, LOUISIANA

safe transit

COPYRIGHT 1958
DANA CHASE PUBLICATIONS
York Street at Park Avenue
Elmhurst, Illinois

editorial voice of the national safe transit program

devoted to improving packaging methods and shipping and materials handling methods for the appliance and metal products manufacturing industries. This section contains plant experience information and industry advances for the use of all executives and plant men interested in improving packaging and shipping methods and in loss prevention. The section contains complete information on the national safe transit pre-shipment testing program for packaged finished products and detailed reports of divisions and sub-committees of the National Safe Transit Committee.

Laboratories Advertise Safe Transit Story

More and more laboratories are featuring Safe Transit in their publications. One of the most attractive publications to carry the Safe Transit story is one published by Hoerner Boxes, Inc. Stressing the use of the NST tests as a damage loss preventive and vital sales aid, Hoerner lauds the manufacturer who uses the NST label. We quote from page three of its sales folder, "Your customers, distributors and dealers know you are a manufacturer who has done your part in assuring *Safe delivery* when the *Safe Transit label* appears on your packaged product."

Another laboratory which has made expressive use of the Safe Transit program is Vanant Co., Inc. of Milwaukee, Wisconsin. Vanant emphasizes scientific testing plus listing the Safe Transit benefits.

Technical Notice: All NST Testing Facilities

The N.S.T. Technical group, chairmanned by P. W. Bush, Westinghouse Electric Corporation, announces a change to the directions for applying the Conbur Test under Project 1, 2b, NST TEST PROCEDURES. The first paragraph reads "The container to be tested shall be placed on the dolly with the face or edge projecting two inches beyond the forward end of the dolly." *ADD*, "or flush with end of dolly." All copies of the procedures issued from NST office after this date will include changes.

Southeastern Claim Prevention Conference Hears NST Bulletin

Carl A. Naffziger, Director of the Freight Loss and Damage Prevention Section of the Association of American Railroads read a bulletin, "Safe Transit —A True Claim Preventive" at the Southeastern Claim Prevention Conference in Jacksonville, Florida on January 21. Mr. Naffziger also conducted a discussion on Safe Transit and claims with those present. NST has expressed its thanks to Mr. Naffziger for his interest in the NST Program.

NST To Be Represented at American Trucking Meeting

The National Safe Transit Committee has been invited to participate in the program of the American Trucking Associations' Annual Meeting to be held in Denver, Colorado on June 17, 18 and 19.

At a meeting in Washington, D. C. in January between John Miller, Executive Secretary of the Freight Claims Council of the American Trucking Associations, and Ralph Bisbee, General Chairman of the National Safe Transit Committee, the 19th of June was selected for the NST presentation.

Wondering About Your 1958 NST Certificate?

Your 1957 certificate dated for termination December 31, 1957 is hereby declared valid until March 31, 1958.

Changes in the certificate format and in various aspects of certification will be announced prior to April 1st.

Newly-Certified Companies and Laboratories

Liebel-Flarsheim Co.
Cincinnati, Ohio
(X-ray apparatus)

Illinois Box & Crate Co.
Plainfield, Ill.
(laboratory)

Headquarters, Mobile Air Material Area
Brookley Air Force Base, Ala.
(laboratory)

Binghamton Container Co., Inc.
Binghamton, N. Y.
(laboratory)

New Film a Boxoffice Hit

Demands for NST's newly-released full color-sound film, "A Blindfold Removed," have kept the NST Audio-Visual department busy. Comments on the film's clarity in telling the NST story keep coming in. Additional prints of the film are being made and will soon be available.

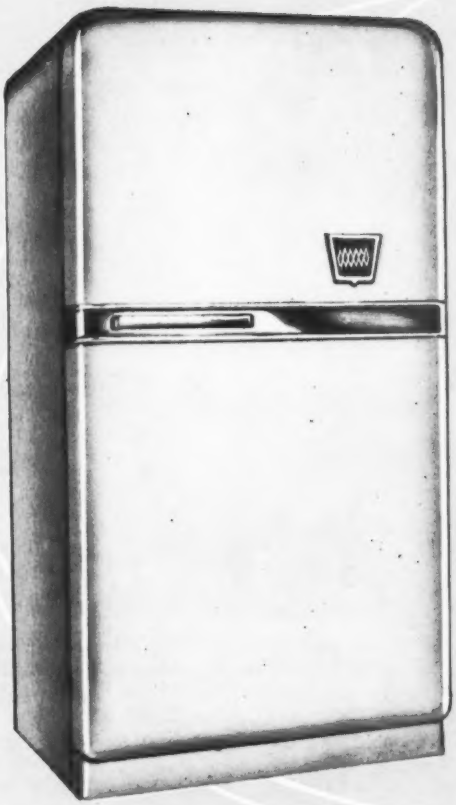
Material Handling Institute Plans 1959 Exposition

Representatives of more than 150 firms offering material handling equipment and services are expected to gather in Hotel Cleveland, Cleveland, Ohio on April 8 to select desired space for their displays in The Material Handling Institute's Exposition of 1959. This exposition will be held in Cleveland on June 9 through 12, 1959.

According to George G. Raymond, Jr., exposition committee chairman, the space selection activity is being held in conjunction with spring meetings of The Material Handling Institute, Inc.

the new

QUICFRĒZ



The new Quicfrez — another fine product properly protected for safe shipment through the use of Watkins Containers.

The Finest Products Go In Watkins Containers

They are preferred because of:

1. Low Cost
2. Stacking Strength
3. 75% Assembled–Upon Receipt
4. Ease of Assembly
5. Easy Handling
6. Minimum Storage Space
7. Protection from Dust and Dirt

THESE COMPANIES BUILD WATKINS CONTAINERS

DURA-CRATES, INC.
940 E. Michigan St., Indianapolis, Ind.

HEMB & MARTIN MFG. CO.
P.O. Box 108, Murfreesboro, Tennessee

ILLINOIS BOX & CRATE CO.
811 Center Street, Plainfield, Illinois

KIECKHEFER BOX & LUMBER CO.
1711 W. Canal St., Milwaukee 3, Wis.

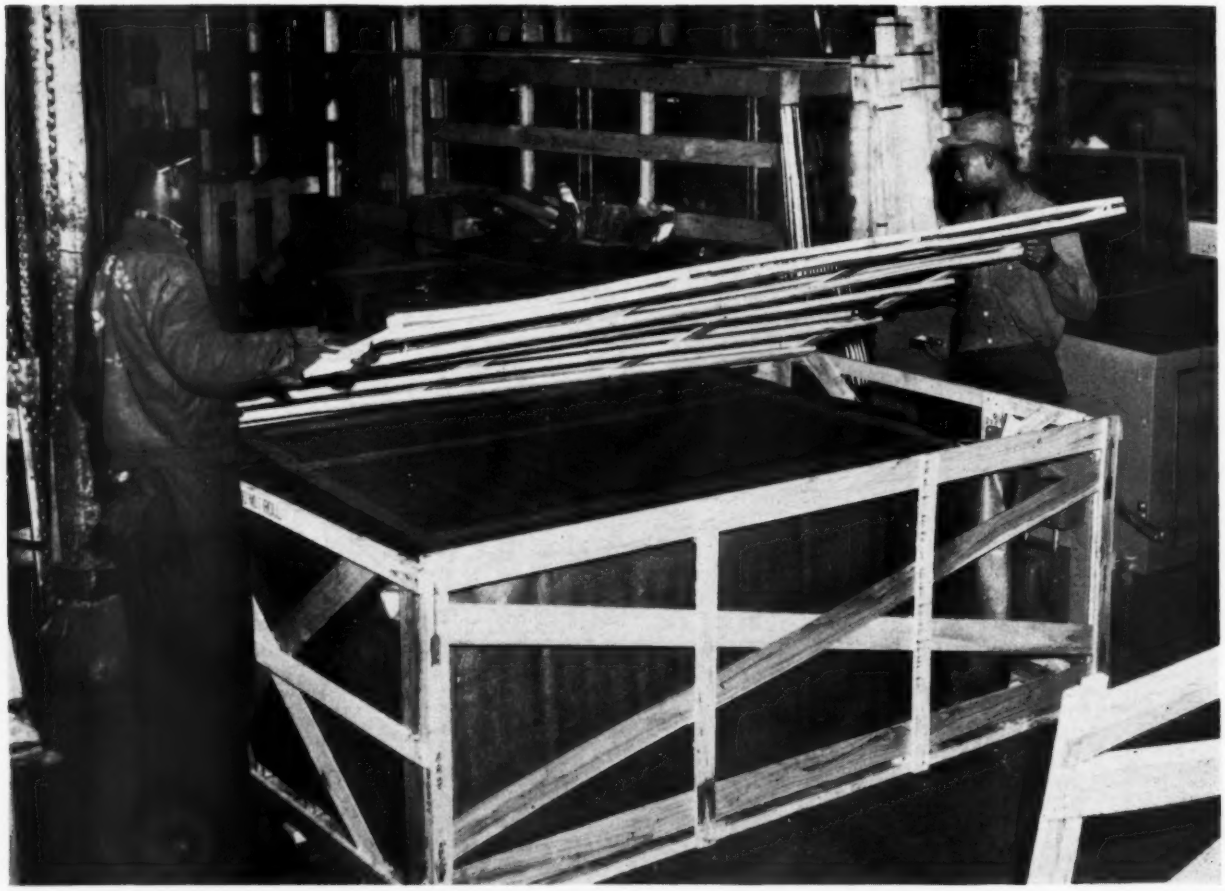
LEWISBURG CONTAINER CO.
243 Singer Street, Lewisburg, Ohio

LOVE MFG., INC.
P.O. Box 548, Wichita, Kansas

UTILITY CRATE CORPORATION
2019 Imperial St., Los Angeles 21, Calif.

Custom Protection . . .

THE WATKINS CONTAINER MANUFACTURERS



One of the final steps in the crating of Refrigeration Appliance's Krack units is the placing of the top piece to complete the NST *approved crate. The method of crating employed was worked out with the help of the crating company supplier.*

Newly-designed crate eases packing and shipping

large, heavy refrigeration unit packed in wooden crate receives good reaction from company's customers

MPM EXCLUSIVE FEATURE

One of the biggest problems facing Refrigeration Appliances, Inc. in the packing and shipping of bulky and heavy refrigeration equipment is handling and ease of unpacking at the customers' end. A re-designed wooden crate which had extra strength built into it solved the problem well.

The refrigeration unit that the new crate was designed for is a 1600-lb. Krack Low Temperature unit cooler equipped for electric defrosting, and designated 36-ED. It has a 36,000-Btu capacity, and it measures 57″ x 32″ x 76″, not including pipe connections.

With such size and weight, it was not easy to design a strong and yet economical crate. One of the requirements set by Refrigeration Appliances was that the base of the crate must have sufficient strength and rigidity to allow their customers to handle the unit safely after the sides and top of the crate are removed. Most of the handling at the customer's end is done to move the unit into its permanent operating position. This meant that the base had to be very durable, because it is usually not removed from the unit until just before being placed in its final position.

After working closely with engineers of the wooden crate supplier, the engineers at Refrigeration Appliances came up with an excellent crate capable of withstanding considerable handling abuse. The new crate measures 64″ x 34″ x 98″, which includes space for the control panel packed with each unit.

Crating is handled by two men in an operation that takes about 30 minutes for each unit. Three one-inch-wide U-shaped channels are bolted to the frame underneath the defroster to serve

as support for attaching to the bed of the crate. A chain hoist is then used to lift the unit up to a height of about two feet to bolt the bed of the crate to the support channels. After this, the unit is lowered to the floor and heavy waterproof paper is wrapped around the defroster for protection during shipment.

The sides and ends of the crate are then nailed on. Then the control for the low temperature electric defrost unit is bolted to two 1″ x 2″ strips of wood and nailed into one end of the still-open crate. This, too, is covered with waterproof paper. All that remains to the simple operation is the nailing of the cover which only takes a few more minutes.

Apply NST label

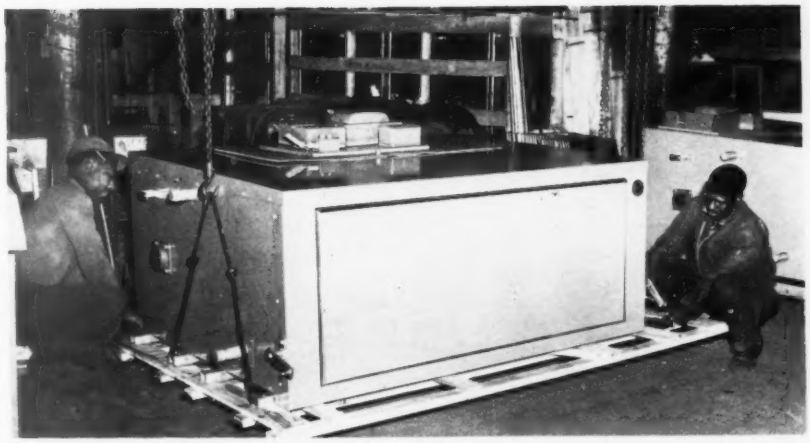
Since Refrigeration Appliances, Inc. is certified under the National Safe Transit pre-shipment testing program, and the crate just described has passed two of the NST tests — the vibration and the incline — two Safe Transit labels are applied to the crate in prominent locations.

When it is necessary to load one crated unit on top of another, such as in shipments of eight units in a trailer truck, 2″ x 4″ pieces of wood are nailed, one at each corner, to aid in supporting the weight of the crate on top. Each piece is the same size as the height of the crate. Three 2″ x 4″ reinforcing pieces of wood are nailed to the top of the crate for additional reinforcement.

Customers' reaction good

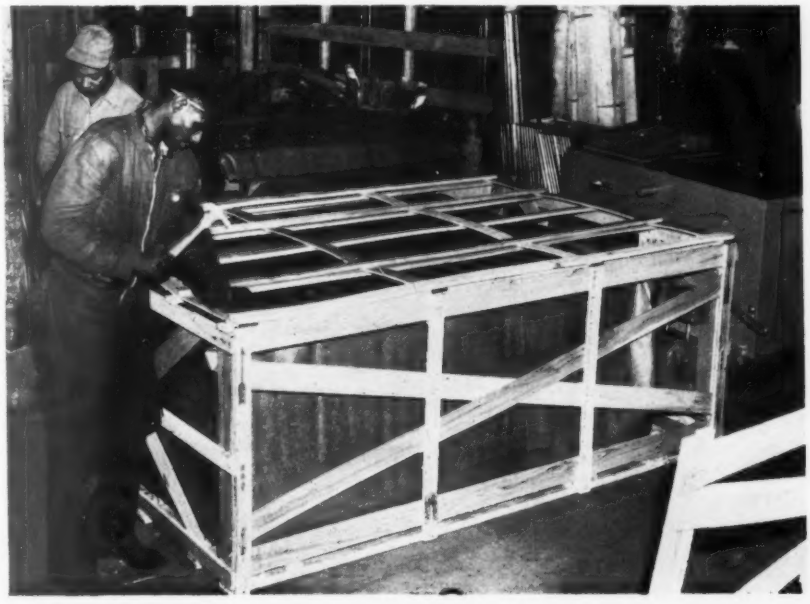
Customers of Refrigeration Appliances, who supply commercial refrigeration components to a number of air-conditioning and refrigeration equipment manufacturers, have received enough satisfied comments from their customers to assure them that all of the effort spent in improving this crate was well worth it.

The job is finished in a matter of only a half hour because of the well engineered crate that the crating supplier developed for Refrigeration Appliances, Inc. Here the workmen are putting the finishing touches to the crate. The final step follows this when the shipping clerk attaches the Safe Transit label signifying that the company is certified under National Safe Transit. Customers reaction to the newly designed crate has been very good, according to Refrigeration Appliances, Inc.



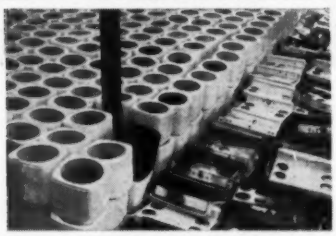
Due to the great bulk of these Krack unit coolers it is necessary to raise it by means of a chain hoist to enable placing of the extra heavy base underneath. The men are bolting the unit to the base in this view. After this step the entire unit is covered with a waterproof paper to protect it in the event that it needs to be stored outside.

In the photo at the left the workman is nailing the sides of the crate firmly in place. Refrigeration Appliances specified that this particular crate be designed for the heaviest duty possible in order to eliminate shipping problems. In the view at the right the workman is bolting the control panel to a separate base which is subsequently fastened into the crate.



D-ENAMELING*

is more economical than ever . . .



Once D-Enameling was a temporary expedient which appliance manufacturers used to stretch critical steel supplies. But that day is gone! Now, the nation's leading appliance manufacturers consider D-Enameling a permanent part of their manufacturing picture. D-Enameling has come of age . . . has assumed its role as a routine step in appliance manufacturing. The reason is simple—D-Enameling is a money saver! D-Enameling transforms scrap loss into profit dollars.

these industry leaders know from experience that D-Enameling transforms scrap loss into profit dollars

Airlines

Home Laundry Appliance Manufacturers

Job Enameling Plants

Range Manufacturers

Refrigerator Manufacturers

Sanitary Ware Manufacturers

Sign Manufacturers

Space Heater Manufacturers

Water Heater Manufacturers

*D-Enameling is a patented process

New Process *D-Enameling* Corp.

Highland and New Haven Avenues • Aurora, Illinois

Supplier personals

→ *from Page 84*

Appointment of **Peter J. Buettner** as regional sales manager for its Southern — Texas territory has been announced by Pemco Corp., Baltimore. Buettner will be in charge of porcelain enamel sales in the newly-designated territory, which includes Tenn., La., Iowa, Ill., Miss., Okla., and parts of Ind., Mo., Ala., Fla., Ky., and Tex.

Promotion of **John A. Zingor** to the position of regional sales manager for the Northern enamel division of Pemco Corp. has been announced by Charles P. Lohman, vice president. Zingor has been a sales engineer for Pemco since 1950.

BUETTNER

ZINGOR

Richard M. Spriggs has joined the research staff of the Ferro Corp., Cleveland, Ohio. He received a baccalaureate degree in ceramics from Pennsylvania State University in 1952; a master of science degree in ceramic engineering from the University of Illinois in 1956, and has been awarded the degree of doctor of philosophy in ceramic engineering from the University of Illinois in February, 1958.

A series of promotions was recently announced by Ford Ballantyne, Jr. — a Wyandotte Chemicals vice president and director, and general manager of the J. B. Ford Division.

C. J. Martin, who has been Buffalo district sales manager since December 27, 1954, has been promoted to manage the Chicago district.

W. Wright Lee, formerly an Atlanta district field sales manager, has been promoted to manage the Buffalo district.

MARTIN

LEE

METAL PRODUCTS STATISTICS

a current report on available production, shipment and sales figures for important products in the appliance and fabricated metal products manufacturing field

GAS WATER HEATERS — December shipments 183,800, 17.2 per cent over '56; January-December 2,544,500, 7.9 per cent below '56.
GAS RANGES, BUILT-IN — November shipments 17,000, 19.7 per cent over '56; January-November 180,500, 20 per cent over '56.
GAS RANGES, FREE STANDING — November shipments 140,100, 4.6 per cent below '56; January-November 1,655,100, 12.3 per cent below '56.
GAS FURNACES — December shipments 40,200, 6.7 per cent below '56; January-December 704,200, 13.3 per cent below '56.
GAS FIRED BOILERS — December shipments 4,900, 14 per cent over '56; January-December 99,400, 3.2 per cent over '56.
GAS CONVERSION BURNERS — December shipments 7,800; 34.5 per cent over '56; January-December 165,100, 11.7 per cent below '56.
ELECTRIC REFRIGERATORS — December shipments 214,600, 17 per cent below '56; January-December 3,350,000, 10 per cent below '56.
ELECTRIC FREEZERS — December shipments 47,400, 18 per cent below '56; January-December 965,000, 10 per cent below '56.
ELECTRIC RANGES, BUILT-IN — December shipments 36,800, 22 per cent over '56; January-December 425,000, 10 per cent over '56.
ELECTRIC RANGES, FREE STANDING — December shipments 77,000, 20 per cent below '56; January-December 980,000, 18 per cent below '56.
ELECTRIC WATER HEATERS — December shipments 60,500, 0 per cent below '56; January-December 800,000, 8 per cent below '56.
ELECTRIC DISHWASHERS — December shipments 29,900, 5 per cent below '56; January-December 390,000, 3 per cent below '56.
ELECTRIC FOOD WASTE DISPOSERS — December shipments 55,300, 26 per cent over '56; January-December 550,000, 7 per cent below '56.
COMBINATION WASHER-DRYER — December factory sales 11,184, 4 per cent below '56; January-December 175,841, 72 per cent over '56.
WASHERS, AUTOMATIC & SEMI-AUTOMATIC — December factory sales 157,982, 28 per cent below '56; January-December 2,722,047, 16 per cent below '56.
WASHERS, WRINGERS & ALL OTHER — December factory sales 48,805, 28 per cent below '56; January-December 867,529, 22 per cent below '56.
*ELECTRIC DRYERS** — December factory sales 84,492, January-December, 868,557.
*GAS DRYERS** — December factory sales, 33,624; January-December, 392,085.
IRONERS — December factory sales, 2,005,* 65 per cent below '56; January-December 41,631, 29 per cent below '56.
VACUUM CLEANERS — December factory sales 237,501, 15 per cent below '56; January-December 3,190,172, 14.3 per cent below '56.
METAL FURNITURE — December shipments 19 per cent over '56; January-December 1 per cent over '56.
TELEVISION — December shipments 923,339, 4 per cent below '56; January-December 6,560,220, 4 per cent below '56.
*RADIO*** — December shipments, 2,031,444, 25 per cent over '56; January-December 9,721,285, 20 per cent over '56.
COMPRESSOR BODIES (Including Automobile Units) — Shipments for October, 202,192, 41 per cent below '56; January-October 3,536,363, 15 per cent below '56.
STEEL SHIPPING BARRELS & DRUMS — November shipments 2,531,695, 16 per cent below '56; January-November, 32,424,702, 9 per cent below '56.
STEEL PAILS — November shipments 4,943,507, 25 per cent below '56; January-November 69,235,275, 12 per cent below '56.
TYPEWRITERS — December factory shipments 126,853; January-December, 1,645,266.

Sources for this information: Gas Appliance Manufacturers Association, National Electrical Manufacturers Association, American Home Laundry Manufacturers Association, Vacuum Cleaner Manufacturers Association, National Association of Furniture Manufacturers, Electronic Industries Association, and Air-Conditioning and Refrigeration Institute, U.S. Dept. of Commerce.
*Note: The above 1956 data have been adjusted to reflect combination washer-dryer sales separately. Combination sales are not counted as either an automatic washer or an automatic dryer. For 1956, breakdown of gas and electric dryer data from which gas and electric combination data have been subtracted, cannot be released without disclosing individual company information.
**Does not include automobile radios.

ADVERTISERS' INDEX

	PAGE
ARMCO STEEL CORP.	1, 8 & 9
BINKS MFG. CO.	64 & 65
BURDETT MFG. CO.	58
CHICAGO MILL & LUMBER CO.	85
CHICAGO VITREOUS CORP.	38
CONTROLS CO. OF AMERICA	4th Cover
COOK PAINT & VARNISH CO.	10
CUYAHOGA SPRING CO.	61
DESPATCH OVEN CO.	42
DETROIT CONTROLS CO.	2nd Cover
DETROIT STAMPING CO.	82
DeVILBISS CO., THE	14 & 15
DOW CHEMICAL CO.	18
FAHRALLOY CO., THE	74
FAIRMONT ALUMINUM CO.	4
FERRO CORP.	75
GENERAL INDUSTRIES CO.	6
GLIDDEN CO., THE	26
GRIGOLEIT CO., THE	61
O. HOMMEL CO., THE	83
HUYCK CONSTRUCTION CO.	84
INGRAM-RICHARDSON, INC.	71
INLAND STEEL CO.	13
L. R. KERNS CO.	45
LA FRANCE PRECISION CASTINGS	77
LUX CLOCK MFG. CO.	7
MACCO PRODUCTS O.	33
MARSCO MFG. CO.	49
McLOUTH STEEL CORP.	17
METAL PRODUCTS MANUFACTURING	20 & 21
METALWASH MACHINERY CORP.	69
MICHIGAN CHROME & CHEMICAL CO.	61
MICHIGAN OVEN CO.	2
MILLS PRODUCTS CO.	11
NATIONAL LOCK CO.	82
NEW PROCESS D-ENAMELING CORP.	90
NORTHWEST CHEMICAL CO.	50
PEMCO CORP.	63
PENNSALT CHEMICAL CORP.	72 & 73
PHILLIPS & BUTTORFF CORP.	77
PYRAMID MOULDINGS	16
RANSBURG ELECTRO-COATING CORP.	70
REDALL INDUSTRIES	81
ROSS, J. O. ENGINEERING CORP.	48
SORENG DIV., CONTROLS CO. OF AMERICA	4th Cover
SOUTHERN SCREW CO.	12
STANDARD STAMPING & PERFORATING CO.	77
TIMESAVER SANDERS	32
TITANIUM PIGMENT CORP.	5
UNION STEEL CORP.	3rd Cover
UNITED WALLPAPER CO.	22
UNIVERSAL SCREW CO.	67
WATKINS CONTAINER MFRS.' ASSN.	87
WEIRTON STEEL CO.	34
YOUNGSTOWN SHEET & TUBE CO.	37

Customer Service YORK ST. AT PARK AVE., ELMHURST, ILLINOIS

"I saw your ad in MPM"

CLASSIFIED

HELP WANTED

Ceramic engineer wanted to take charge of control and development work in a progressive porcelain enamel plant specializing in architectural and industrial enameling. Interesting and diversified work in a clean plant. Enameling experience preferred but not necessary. Write experience and qualifications.

Box 3-A, Dana Chase Publications, York St. at Park Ave., Elmhurst, Ill.

SITUATION WANTED

Experienced sales person, widely known in metal working and finishing industry with 18 years successful record desires new company affiliation. Will consider manufacturer's agent arrangement on several non-competitive lines. Philadelphia headquarters.

Box 3-B, Dana Chase Publications, York St. at Park Ave., Elmhurst, Ill.

MANUFACTURING EXECUTIVE AVAILABLE

Wide experience in metal fabricating, methods, tooling, cost design. Wide product range from job shop to warm air furnaces. Age 37. Resume on request. **Box 3-C, Dana Chase Publications, York St. at Park Ave., Elmhurst, Ill.**

FOR SALE

Porcelain enamel furnace, box type, 5 ft. x 12 ft., steel clad, with double-speed fork. Can be seen at **Cole Hot Blast Mfg. Co., 3817 S. Racine Ave., Chicago, Ill.**

DEVELOPMENT ENGINEER

A leader in the field of manufacturing heating appliances seeks an experienced oil and gas heater test and development engineer. Opportunity exists for person selected to get in on the ground floor of new Engineering Department being set up in plant in the South. Send full details including education, experience and salary desired to **Box 4-C, Dana Chase Publications, York St. at Park Ave., Elmhurst, Ill.**

REPRINTS AVAILABLE

SPECIFICATIONS FOR WHITE APPLIANCE FINISHES by Edward G. Bobalek, Professor of Chemical Engineering, Case Institute of Technology. Four pages—two color. Critical problems in testing discussed, procedures and pitfalls pointed out and explained in this report which is of interest to all organic finish users. 15¢ per copy.

A STUDY OF THE CHARACTERISTICS OF ANODIZED ALUMINUM ALLOYS by R. V. Vanden Berg, Aluminum Company of America. Six pages — black and white. Covers a wide variety of surface treatments available for aluminum, and the many finish characteristics. 25¢ per copy.

Please send all orders plus remittances to: Customer Service Dept., Dana Chase Publications, York St. at Park Ave., Elmhurst, Illinois.

THE RIGHT ANSWER FOR LARGE OR SMALL PLANTS.....

USP PALLETAINERS®

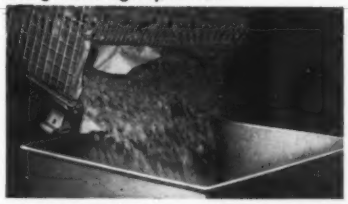
Why pay a premium for wasted floor space when you can make it do double, even triple duty by simply storing, stacking or transporting your products and materials in USP Palletainers.

Palletainers are readily available in a wide variety of sizes, types and styles to meet your needs. Engineered to handle both light and fragile products, or heavy unit loads up to 6000 pounds each with perfect safety and full inventory visibility. Palletainers will stack to the rafters safely, and cut your shipping losses, too. And . . . when empty, they can be folded flat for space-saving plus lower return freight rates.

No matter what you manufacture—store or transport—in a large plant or small . . . *You need* Palletainers!

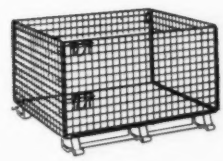
Palletainers (warehouse type) afford a highly versatile "parts bin" arrangement. May be opened or closed without affecting strength and rigidity of stack.

Palletainers "stack-ability" saves valuable floor space—protects even fragile loads such as perishable produce—contents always visible—always clean.



Bulk-Lode Palletainers with liner delivers fine materials, chemicals, pellets—even liquids, efficiently and economically. Another answer to safe, sure shipment.

Palletainers are well known to the food freezing and processing industries because of their aeriation and sanitation factors. Only Palletainers can do so many jobs so well!!



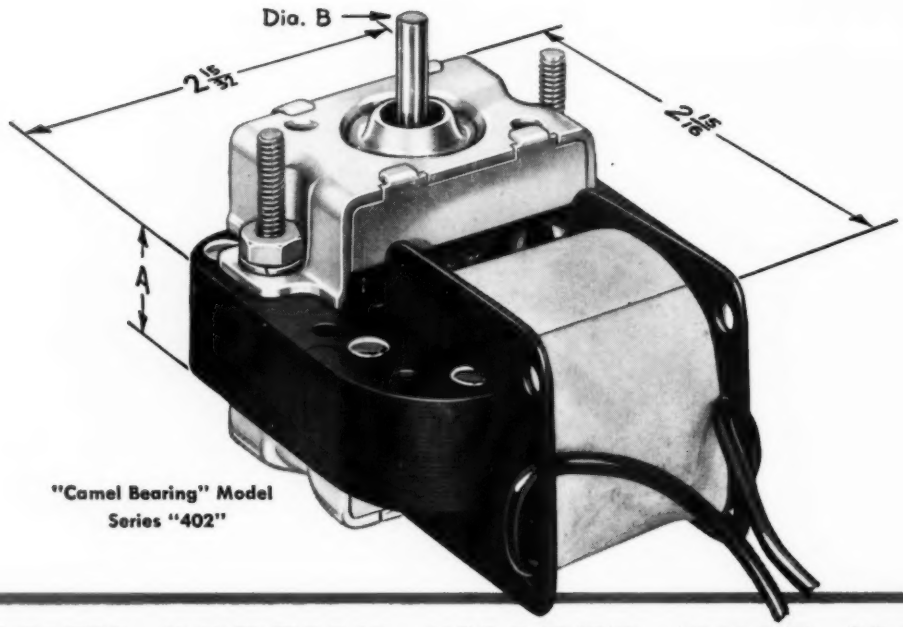
Bearing Plate
2000—4000—6000 lb. Capacities

Hi-Lode
2000—4000—6000 lb. Capacities

Warehouse
3000—4000 lb. Capacities

Bulk Lode
2000—4000—6000 lb. Capacities

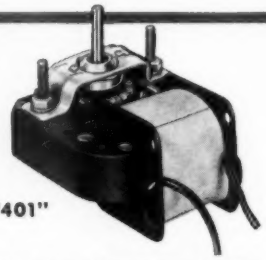
UNION STEEL PRODUCTS CO. USP **ALBION MICHIGAN**



"Camel Bearing" Model
Series "402"

SPECIFY SORENG SHADED-POLE MOTORS

Where Economical, TROUBLE-FREE Operation is a Must



Series "401"

Series "401" for Standard Life Applications

Here's a tough, durable Shaded-Pole Motor. The "401" has positive aligned bearings with self-aligning features and an open-skeleton frame for effective heat dissipation. You have your choice of 12 models. You'll find a "401" Shaded-Pole Motor that meets your needs exactly.

Series "402" with New CAMEL BEARING Holds Lubricant Thousands of Hours Longer

The "402" Shaded-Pole Motor is built to last. It's a rugged little powerhouse with an EXTRA long life due to its exclusive, new CAMEL BEARING design. This special bearing bracket provides automatic, positive oil circulation even under high temperatures. Oil is constantly feeding into bearing cavities as operating conditions demand.

The "402" is made of high quality, silicon steel. It's versatile, too! The rotor bracket is easily removed so that the motor can be adapted to a variety of field applications. Standard mounting holes make it interchangeable with other motors. Range of 12 models cover all types of applications.

MODEL NO'S (2)	402-10 402-11 401-10 401-11	402-20 402-21 401-20 401-21	402-30 402-31 401-30 401-31	402-40 402-41 401-40 401-41	402-50 402-51 401-50 401-51	402-60 402-61 401-60 401-61
VOLTS	115	115	115	115	115	115
FREQUENCY	60	60	60	60	60	60
AMPERE—NO LOAD	0.31	0.42	0.55	0.64	0.97	1.31
WATTS—NO LOAD	13.5	19	24	27.7	40	53
R P M—NO LOAD	3400	3480	3500	3570	3560	3550
MAX. HP. OUTPUT(1)	1/500	1/200	1/125	1/75	1/50	1/40
START TORQUE OZ. IN	0.58	1.4	2.3	2.3	3.3	4.9
STALLED WATTS	18	29	40	45	68	98
STACK WIDTH "A"	5/8"	5/8"	5/8"	5/8"	1-1/8"	1-1/2"
SHAFT DIA. "B"	0.182	0.182	0.182	0.182	0.2178	0.2178
WEIGHT—POUNDS	0.8	1.2	1.4	1.6	1.9	2.4

SORENG SHADED-POLE MOTORS HAVE OVER 140 PRODUCT APPLICATIONS

Typical Applications include: springwire, gear, chain, rubber belt and friction drives or, to move high velocity, heater or sirocco air.

NOTES:

1. HP RATING AT 3000 RPM—CONTINUOUS DUTY FAN LOAD
2. ALL NUMBERS ENDING IN "0" DENOTE CLOCKWISE SHAFT ROTATION ALL NUMBERS ENDING IN "1" DENOTE COUNTER-CLOCKWISE SHAFT ROTATION
3. 402—LONG LIFE SERIES
4. 401—STANDARD LIFE SERIES
5. LEADS—#20AWGX 7" LONG LEAD WIRE THERMO PLASTIC

Send for your copy of Soreng's new booklet on Shaded-Pole Motors. It contains drawings, technical data and specific applications.

CONTROLS COMPANY OF AMERICA
Manufacturers of *SORENG* controls
9559 SORENG AVENUE • SCHILLER PARK, ILLINOIS

controls that make modern living possible